ISSN-1079-7832

A Publication of the Immortalist Society
published with the cooperation of the American Cryonics Society and the Cryonics Institute.

LONG LIFE

Longevity Through Technology

Volume 50 - Number 04

The Immortalist Society wishes to thank the American Cryonics Society (ACS) and cryonics trusts managed by ACS for sponsoring non-subscriber mailings for this edition

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CRYONICS INSTITUTE
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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.

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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

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11) Member Ownership and Control

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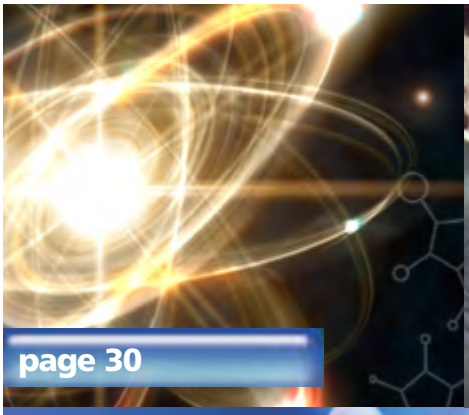
page 30


page 37


page 08


page 12

LONG LIFE MAGAZINE

A publication of the Immortalist Society

ORGANIZATION NEWS

FEATURE STORIES

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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 checklist of important steps to consider.

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

  Some members use term life and invest or pay off the difference at regular intervals. Some use whole life or just prepay the costs outright. You have to decide what is best for you, but it is best to act sooner rather then later as insurance prices tend to rise as you get older and some people become uninsurable because of unforeseen health issues. You may even consider making CI the owner of your life insurance policy.

- ☐ Keep CI informed on a regular basis about your health status or address changes. Make sure your CI paperwork and funding are always up to date. CI cannot help you if we do not know you need help.

- ☐ Keep your family and friends up to date on your wishes to be cryopreserved. Being reclusive about cryonics can be costly and cause catastrophic results.

- ☐ Keep your doctor, lawyer, and funeral director up to date on your wishes to be cryopreserved. The right approach to the right professionals can be an asset.

- ☐ Prepare and execute a Living Will and Power of Attorney for Health Care that reflects your cryonics-related wishes. Make sure that CI is updated at regular intervals as well.

- ☐ Consider joining or forming a local standby group to support your cryonics wishes. This may be one of the most important decisions you can make after you are fully funded. As they say-"Failing to plan is planning to fail".

- ☐ Always wear your cryonics bracelet or necklace identifying your wishes should you become incapacitated. Keep a wallet card as well. If aren't around people who support your wishes and you can't speak for yourself a medical bracelet can help save you.

- ☐ Get involved! If you can, donate time and money. Cryonics is not a turnkey operation. Pay attention and look for further tips and advice to make both your personal arrangements and cryonics as a whole a success.

CRYONICS INSTITUTE
Technology for Life

LONG LIFE

A quarterly publication of the

Immortalist Society

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Volume 50 Number 4
Fourth Quarter 2018

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

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CI EXECUTIVE REPORT

Dennis Kowalski - President, Cryonics Institute

Dennis Kowalski - CI President

Hello All,

2018 was a great year for CI and I would like to thank all of our members who have decided to join us on this exciting ride into the future. For those of you reading this who are not members, please consider joining the Cryonics Institute in 2019 - the more of us who are aboard, the better all of our chances become to see the future together.

As you know, we have made significant improvements to our Clinton Township facility. Some of the improvements are cosmetic like fresh paint and better lighting, others are utilitarian like safety rails and improved LN2 delivery. The improvement I am most proud of is the addition of six new cryostats, which brings our facility to full patient capacity. When you think that only a few decades ago the Cryonics Institute only had one patient and one cryostat, and then look at where we are today, it is a great proof positive of how much we have grown and expanded over the years. Special thanks to Andy Zawacki and Mike McCauley for their hard work in making these improvements.

Recently I had the opportunity to make a presentation at the Church of Perpetual Life giving a talk about cryonics and the Cryonics Institute. For those of you who don't know, the Church of Perpetual Life is dedicated to life extension and hosts many events with speakers on the cutting edge of this exciting field. As I have said before, I would be quite happy to see life extension and age-reversal technologies discovered in our lifetimes rather than having to go through cryopreservation and wait for those technologies to happen decades or even centuries later. However, no matter how hopeful the current research is, if it doesn't happen in our lifetimes we have a "backup plan," and that plan is cryonics.

The event was well-attended with a lot of interested people curious to know more about our "Ambulance to the Future." The program was also live-streamed on YouTube, so it was available to people all over the world who could also ask questions via live chat. And I certainly received a number of questions - one of the most common questions was about how the cryonics process actually works from declaration of legal death to long-term cryostasis. We call that sequence of events standby, and, as always, I cannot stress enough how critical good standby planning and preparation is to a successful suspension. To get started, I recommend you review our Standby Manual, which includes great information and advice on standby planning. A second recommendation would be to fill out our online Membership Data Form. This form is not specifically geared to standby, but it does provide valuable information to CI that you will need to have in place to be cryopreserved with us. It also makes a great list of action items and required forms to help you gauge how prepared you are with regard to your necessary CI paperwork, funding and other formal pre-planning steps.

The Perpetual Life speech was a great capstone to a year where I had the privilege of giving many interviews to the press about cryonics, including the very high-profile program "Good Morning Britain" which has a viewership of around 700,000 viewers daily. It's great to be able to reach thousands of people, but whether an audience is 10 people or 10,000, every single opportunity to get our message out counts. With that in mind, I would like to offer some advice on how to engage people about cryonics.

As cryonicists, we need to get "buy-in" from those who are going to help us in the standby process when we cannot help ourselves. These people include funeral directors, emergency personnel and perhaps most important, friends and family members.

The most important thing to remember about getting someone's "buy in," whether a family member or a professional is that the person *does not need to agree* with our opinion about the viability of cryonics. This is the biggest mistake most of us make - we want to convince those around us of our ideas. That's just human nature. However, in the case of asking for standby help and honoring our suspension arrangements, the goal is not to get a person to agree with cryonics in principle, but to simply explain what we want done and have them agree to honor our wishes.

Usually you will get resistance from a person if they think what you want done is irrational and here is where most people would begin to argue about why cryonics makes sense and justify their decision. My approach is that my mind is already made up, so whether someone else thinks it is a bad decision or not doesn't really matter. All that matters is they agree to honor my wishes to be cryo-suspended. I find that this calm, rational approach works best because instead of arguing complicated theories I am presenting a much easier question - "Will you honor my wishes and do what I am asking you to?"

I find this calm, confident approach also works well for me when being interviewed. I make sure to express that this is my choice and my opinion and I do not expect others to necessarily agree with me or make the same decision themselves. Often people who were initially hostile to the idea come around and become curious about the reasoning that lead me to choose cryonics and are more willing to listen with an open mind rather than simply rejecting the idea outright. Once you can open a dialogue you give others the chance to consider what you're saying and decide for themselves.

There were two notable events in 2018 involving cryonics pioneers of special significance to the Cryonics Institute. First, 2018 marks the 100th birthday of our founder, Robert Ettinger. Mr. Ettinger was cryopreseved on July 28, 2011.

Second, Dr Yuri Pichugin, CI's Director of Research from 2001 to 2007 was preserved by KrioRus in later November of this year. Dr Pichugin was instrumental in creating and refining CI's CI-VM1 perfusion solution.

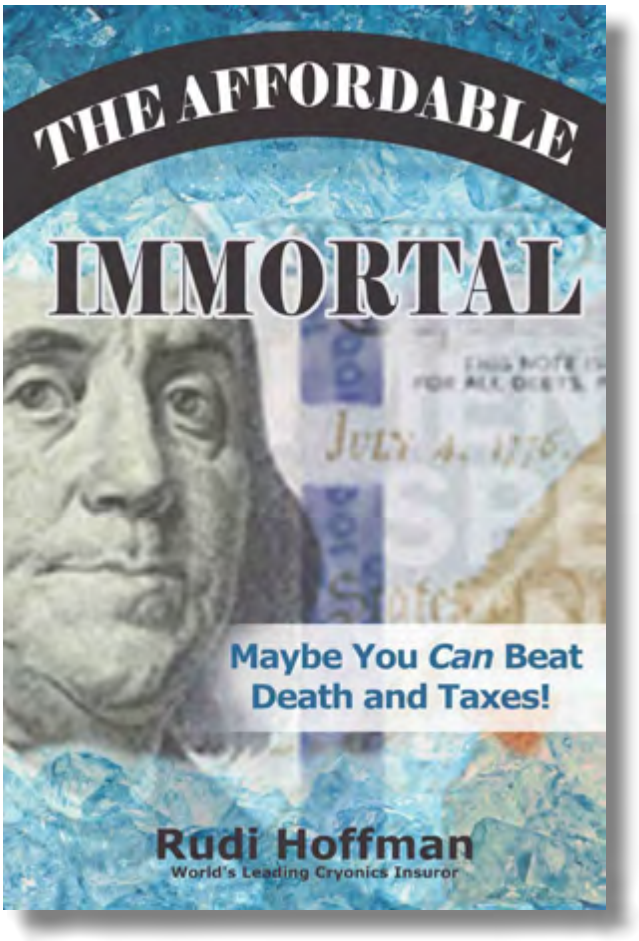
We owe a great debt of gratitude to both these cryonics pioneers and will continue to work hard to make their visions of cryonics a reality.

In closing, I would like to wish everyone a very happy New Year with hopes that your 2019 will be a great year. I am very excited for all that we have coming up at CI in 2019, and I thank you for being a part of it with us!

Dennis Kowalski
President - Cryonics Institute

"The Affordable Immortal"

Special to Long Life Magazine



Introduction by York W. Porter, Immortalist Society President

My dear friend Rudi Hoffman continues his wonderful exposition on how cryonics is, indeed, an affordable option for the vast majority of his fellow humans in this issue of Long Life. Through his kindness, this magazine will be able to present his entire excellent book to our readers over the months. For readers who, quite understandably, just "can't wait" for the issues to roll by, you may go to amazon.com and order a copy for yourself. In this issue Rudi gives a short exposition on the fundamentals of cryonics. In the upcoming issues (chapters), he will begin to explain in detail how this wonderful concept is something you can, with a little bit of planning, avail yourself of. Rudi's advice is straightforward, sensible, and very readable. You don't want to miss a single word of this free offering to Rudi's fellow cryonicists.

Please note, however, that my deep respect and friendship for Rudi notwithstanding, the opinions and viewpoints here are entirely his own. Cryonics is a somewhat complex area (though not as complex as its critics might indicate---the basic idea is quite simple and the alternative is clearly much less desirable). That means that, as in any area of human endeavor, ideas and opinions differ somewhat from individual to individual. You should double-check any concerns you might have, costs, paperwork needed, etc. with Rudi or other cryonicists. No one person (including yours truly) is an expert on all aspects of this exciting human endeavor and it takes the efforts of folks from all walks of life to maximize our joint efforts. Rudi has certainly done his part and more with this excellent offering of his professional skills and knowledge.

Rudi's book is going to be reprinted in this magazine in installments. For those who, quite understandably (especially after reading this first installment), "just can't wait", the Amazon website offers, for a very small amount, a way to get the information to you in a much speedier fashion. Rudi's contact information is as follows for those who need help even sooner than that. Simply use the following references:

Email: rudi@rudihoffman.com

Phone: 386-235-7834

Website with "Quote Request" form and short videos under the "Cryonics" tab can be found at www.rudihoffman.com

Finally, in our usual "caveat emptor" style, even with great and long-standing friends like Rudi, Long Life readers should note that the following information entirely represents Rudi Hoffman's viewpoints. Cryonics is a large subject and thinking on many points can and will vary from individual to individual. Also no one individual is omniscient about this complex field. Don't hesitate to double-check any information (even from yours truly) with other folks to try to get as well rounded a perspective as you can reasonably attain. That being said, what follows is an excellent attempt to try to deal with a practical problem in cryonics and that is the necessity of coming up with a reasonable mechanism to fund it. As the saying goes, in this world there are no "free lunches". Cryonics organizations don't necessarily provide services to make money but they simply must have money in order to provide services and in order to insure the continued safety of the individuals already under their care. Rudi Hoffman offers a very readable approach to helping individual cryonicists answer that need. We started, of course, at the beginning with Chapter One. Chapter Two begins on the next page.

The Affordable Immortal

Chapter 2

A Time Machine to the Future

SO, just what IS cryonics? Could cryonics be your time machine to the future?

This chapter is intended to provide basic information about cryonics to help you answer those questions. It is hoped that the level of explanation is appropriate for a well-informed individual who is curious about the science of cryonics as well as about the practical aspects of personally becoming involved with cryonics.

The purpose of this chapter is not to focus on the science or technological feasibility of cryonics. Nor is it to provide the history of this intriguing field of endeavor, although that would be a different and fascinating chapter or even book. Instead it is a helpful overview of this fascinating emerging science.

Cryonics, as defined by Google:

cry·on·ics - (krīäniks)

noun

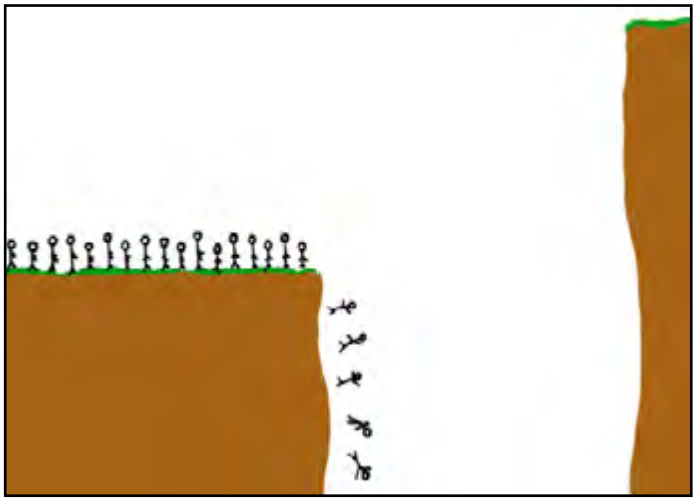
The practice or technique of deep-freezing the bodies of people who have just died, in the hope that scientific advances may allow them to be revived in the future.

However, I prefer an even more straightforward definition, so I propose:

Cryonics is an experimental procedure that preserves a human being using the best available technology for the purpose of saving his/her life.

Cryonics as a Medical Intervention

Here is a cartoon drawing with stick figures portraying the state of the human condition:



This cartoon is from a brilliant research publication on cryonics by Tim Urban. The simplicity of the figure is intentional, to show that you and everyone you know is going over the cliff of death. What if there were a bridge, or a ladder, to get to that far side? Would you take it, or would you follow the mainstream of humanity over the edge?

While conceptually simple, the actual practice of cryonics is medically and technologically complex. Like other medical procedures such as heart transplants, the idea is simple in concept, but difficult in execution.

Cryonics has further analogies to heart transplants, in that even the very idea has been controversial. As these words are written in 2018, the distinction between heart transplants and cryonics is significant. Heart transplants, which at one time were controversial and remain costly, are now considered mainstream medicine. Former United States Vice President Dick Cheney had a heart transplant at age 71. Costing from $500,000 to a million dollars, with no guarantee of success, heart transplants and other organ transplants are increasingly bringing us into the era of "science fiction" medical practice.

In contrast to organ transplants, as of this writing the actual science and technology of cryogenically preserving humans and higher animals remains in its infancy and unproven. While the cryogenic preservation of sperm, eggs, embryos, and some tissues is no longer even considered remarkable, the technological issues involved with preserving and reviving animals with millions or even trillions of cells remain significant.

There *are*, however, numerous "proof of concept" ideas related to the practice of cryonics. These are more accurately described not just as "proof of concept" but are instead actual current level science. These include:

1. Cryogenic storage and viability of frozen sperm, eggs, and embryos
2. Surgical operations performed on humans who are cooled to reduce damage
3. People who survive with their brain functions intact after "drowning" or being stuck in snow drifts
4. Animals who go into a state of suspended animation and are later revived with complete functionality intact
5. The technological challenges that remain to be solved for "cryonics" with large animals like humans are significant. However, it may be important to realize that no responsible scientists assert that there are any laws of physics that would need to be violated in order for cryonics to "work". Moreover, there are many responsible and mainstream scientists who have endorsed the idea, at least on a conceptual basis.

To be fair and even handed, it should be observed that cryonics in 2018 is still far from a "mainstream" idea. No less an authority on the possibilities of science and technology than Michio Kaku has an internet video asserting his opinion on "Why Cryogenics is Bogus."

Regrettably, Michio Kaku is still misinformed by the two "GREAT MYTHS" of cryonics, based on the content of the above referenced video. These are:

Myth 1: Current cryonics protocols do nothing to reduce freezing damage and

Myth 2: Cryonics is only for very wealthy people.

Kaku is disappointingly poorly informed on both of these ideas, as even a cursory bit of research shows both these myths to be unambiguously false.

It may be helpful at this point to be reminded that many if not most medical interventions have gone from being considered "freakish" to "of course."

Anesthesia, defibrillation, in vitro fertilization, and organ transplantation, for example, were all decried at some point as immoral. Some church leaders and so called "ethicists" expressed indignation and shock about "Man playing God."

However, now all of these medical interventions are considered to be reasonable options, indeed a standard of care. Interventions that were formerly controversial are now almost a right to the patient and indeed an obligation of modern medicine.

Is it possible that the medical bio stasis of cryonics may follow a similar path?

Cryonics as Currently Practiced

Cryonics is far from a new idea. Robert Ettinger, in his seminal book published in 1964, *The Prospect of Immortality*, provided the basic framework of "freeze, wait, reanimate." He later founded the Cryonics Institute near Detroit, Michigan, where he currently resides while waiting resuscitation.

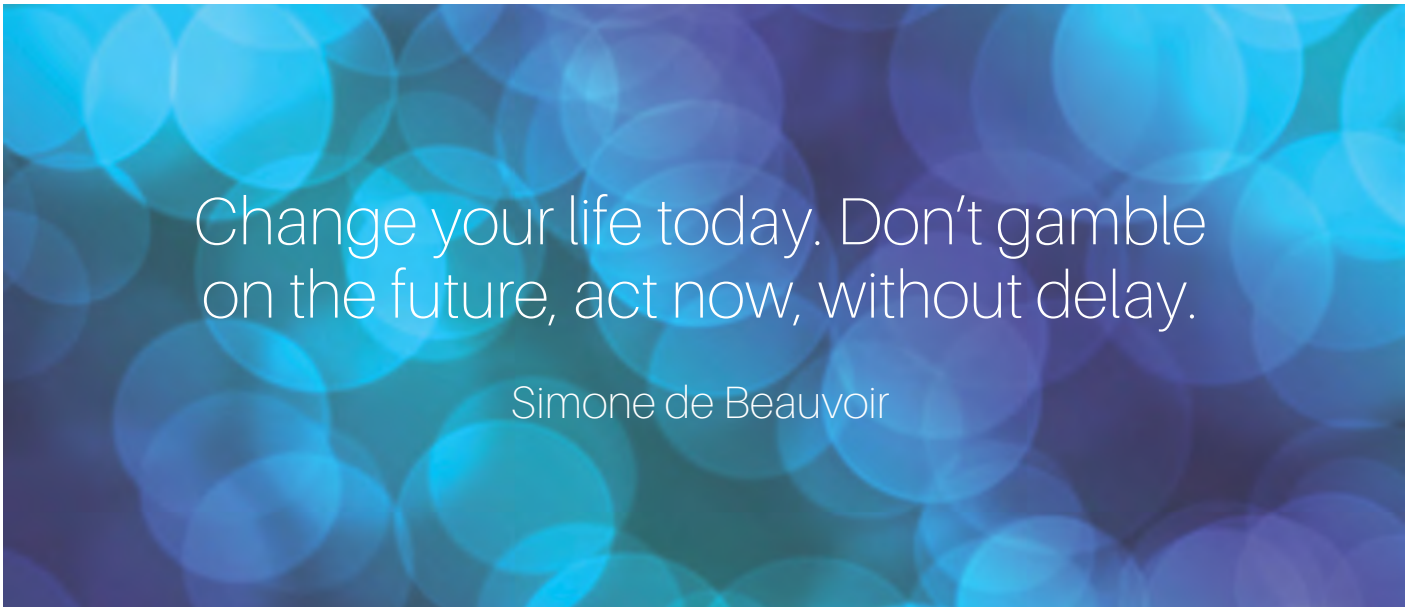
There are now perhaps half a dozen organizations throughout the world that are engaging in the practice of cryonics. The best known and most solidly established are the two main cryonics organizations we will focus on in this book, Ettinger's Cryonics Institute and the Alcor Life Extension Foundation, located in Scottsdale, a suburb of Phoenix, Arizona.

Both of these organizations have been quietly and solidly in place for decades. Alcor was founded in 1972, the Cryonics Institute a few years later.

While unproven, cryonics is an option and a personal choice that several thousand people have been making for themselves since the inception of the idea.

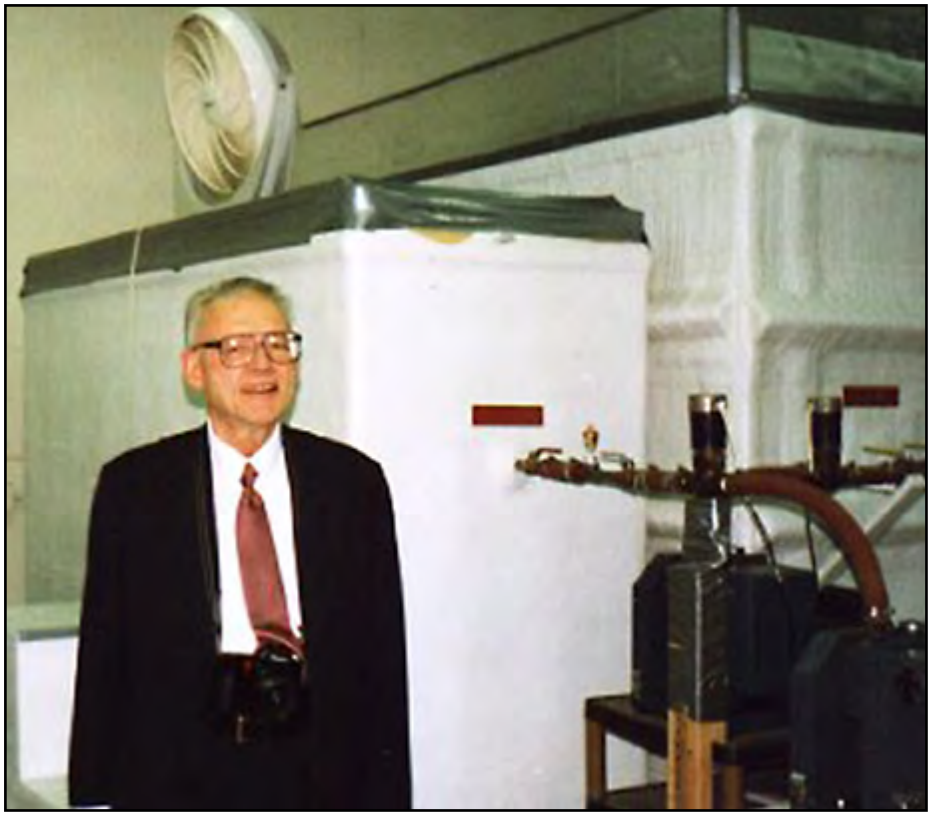
As of this writing, the number of people actually fully signed and funded for cryonics is surprisingly small. Membership at Alcor Life Extension Foundation and the Cryonics Institute, along with the American Cryonics Society and a few developing cryonics facilities throughout the world, total a membership less than 3000. Still, it seems that this is a "risk/reward" determination best left to reasonably well-informed individuals.

Editor's Note: In the chapters that follow, Rudi Hoffman will get more into the details of specific ways that you and your loved ones may benefit from cryonics and will give numerous examples of various approaches to solving this important problem. As indicated in the previous issue of this magazine, the primary purpose of cryonics is not to make money but the realities of the world are that the cryonics services providers must have money to stay in business and assure, thereby, the safety of the individuals under their care. The upcoming information in future issues should be of great help to you and your loved ones as you consider this somewhat "unglamorous" but nevertheless quite necessary aspect of this life saving technology. The information offered by my friend Rudi is only the beginning of his effort here and it is very important that you "stay tuned" to the excellent information that will follow in later issues of this magazine.



Remembering Hugh

Introduction by York W. Porter, Immortalist Society President



While getting each issue of the magazine ready, I oftentimes will look through several previous issues looking for material for the "Looking Back" or other columns. While doing so I came across an article "Meet Hugh Hart". Hugh was a long-standing member of the Cryonics Institute and of the Immortalist Society. He was a solid supporter of this magazine and would provide financial support when and where it was needed to try to spread Robert Ettinger's outstanding concept. Cryonics can certainly be thought of as a wonderful concept and very well thought out idea but the ultimate vehicle for carrying it out will be the individuals involved in it and especially those who are willing to put their "shoulder to the wheel" in trying to help push this wonderful concept forward. Hugh was certainly one of those.

Regrettably Hugh and I had a brief "falling out" when, while chairing my very first meeting of the Immortalist Society, I inadvertently insulted him while he was addressing the membership. An apology note from me, followed by the healing effects of time, smoothed everything over and he and I became fast friends. Hugh revealed to me that his plans, after his retirement which loomed very near ahead, was to go door to door and try to sell cryonics that way. This tied in with the concept I had then (and to some degree now) that cryonics is like life insurance in that while very few people call up the insurance company right after a commercial, they are prepared by the commercial for the salesman when he comes to your door. It also was a corollary for myself that while all the efforts at spreading information about cryonics were very well worthwhile, ultimately cryonics had to be sold, to some degree, "one on one", by the contact of interested persons with those who were already involved in the endeavor.

Selling cryonics door to door wasn't a new concept, having been tried a time or two in the past. In Hugh's case, though, I felt it had at least an interesting chance in that Hugh had worked in part of the years of his youth for the Fuller Brush Company as a door-to-door salesman. In that position, Hugh became accustomed to that normal state of affairs in the industry, and that was the reality of rejection. Most of the time, the answer to a door-to-door sales call is "No" and Hugh was prepared for that. In our discussions, Hugh talked about that fact but it was obviously overcome by his professional background with Fuller and with his enthusiasm for cryonics. Hugh was a strong believer in Robert Ettinger's concept and was determined to make this work.

The last time I talked with Hugh was at a dinner that Robert Ettinger hosted at a steakhouse in the Detroit area. Time was getting by and Hugh was getting closer each day to his retirement date from his job as a pension specialist/counselor in Chicago. We both talked excitedly about his plans and were looking forward to Hugh's efforts at what was obviously going to be a "labor of love". Sadly, this plan never came to fruition as Hugh wound up in the care of the Cryonics Institute before he could even begin.

Nevertheless, in honor of my friend, whose memory was refreshed by coming across this article, the following article is offered for those who never had the profound pleasure, as I did, of personally knowing this fine man.

Meet Hugh Hart

Hugh Hart was born December 30, 1926 into a farming family, literally walked to school to a one room country school for 8 years where he was taught all those years by the same teacher. Hugh, in spite of this modest beginning, graduated from the University of Illinois as Phi Beta Kappa (i.e., with highest honors) and with a split major in philosophy and mathematics. He stayed on for his master's degree, then at Yale, he completed all the course work necessary for a Ph.D. in philosophy. He likes to joke that perhaps after revival he will get the degree fully conferred but adds that "By that time we will all be offered brain enhancement anyway!"

After serving two years as a draftee, Hugh taught high school mathematics for 16 years. He next managed a small stock portfolio for several years and even worked as a commodities representative for a short stint until he says he realized that "the public speculator cannot win". For the last 17 years, Hugh has been a pension counselor for a 6 billion dollar municipal fund that serves Chicago workers.

Hugh plans, after he retires in June of 2003, to do work for the balance of his life oriented toward the goal of "saving as many lives as possible...as many as will take my advice. It is in my golden years that I will do the most social good". While the above information is of some interest to the reader, to get a more full understanding of Hugh it is necessary, as he himself puts it, to know some of his strongest beliefs, hopes and fears and even predictions, the chief of which, in the belief arena, is that "The crowning achievement of the human race is, speaking broadly, the scientific method.

The fruit of the endless hypothesizing, experimenting and verifying of science is the knowledge and technology we have today. Moreover, it has accomplished in only a few centuries, dwarfing the achievements of all preceding millennia."

As a second and more personal viewpoint, Hugh states: "I believe that when I die, that's it, lights out, never again another thought or feeling. This belief is heartrending for one who loves life as much as I. No one faces a greater tragedy. It is ultimate".

Hugh Hart has certainly "put his money where his mouth is", with generous donations towards helping *The Immortalist* in its attempts to reach more people. His latest donation involves giving out free subscriptions to people with the hopes of interesting them in cryonics. As an individual, he certainly sets an example for more of us to follow. See, for example, his article on "Selling Cryonics" which follows:

Selling Cryonics

By: Hugh Hart

People seek relief from the thought of their ultimate demise in many ways. I will list a few: Religion (most with a ready made solution), suicide (!), mental imbalance, use of alcohol and other drugs, being a workaholic. A rational solution is to admit that one will surely die but to do what cone can to achieve life again, right here on earth. If anything has the credentials for bringing it about, it is science. I speak, of course, of cryonics.

At present cryonics can only accomplish the initial phase of its goal. This itself offers, however, considerable comfort. I use "cryonics" in a broad sense: freezing, vitrification, or whatever proves to be most effective in placing our bodies (or, at least, our brains) in biostasis, a holding pattern, allowing medical and other sciences to "catch up" to the task of repair, resuscitation, etc.

All quite logical you say. Then why is cryonics such a hard sell? Obviously it is. Otherwise, instead of a few individuals in biostasis per decade, the rate would be thousands per day. I predict that the time will come when citizens will demand that their elected representatives regard suspensions as a birthright and fund them for all. But, for the meantime, that is not the case and the question must be asked again: Why is cryonics such a hard sell?

One of the most persuasive answers to my question is that of Saul Kent, a cryonics pioneer. He thinks our product is not good enough to tempt the buyer. He puts his money where his mouth is, making large donations to speed the science along.

There are people whom we can dismiss who refuse to think about cryonics. They go along with the "politically correct" contention that they do not know from whence they came nor to where they will be going, but that is nothing about which to be worried.

I believe that in spite of Saul's argument, there are an enormous number of people in the United States, who, like himself and us other cryonicists, can be persuaded to make the cryonics bet. But I fear that there is a more fundamental reason for the apathy.

If one does not need something, then one is not going to buy it, arguments to the contrary. What I am saying is that most people do believe that my second primary belief, about life being completely over at death, is false. For one reason or another they feel assured of an "afterlife in a realm not on earth.

I may shock the reader with this revelation. I too would be on the side of the majority if I knew that the idea of an afterlife for us carries metaphysical certitude. It would be illogical (hence irrational as well) to seek a lesser good (our proposed resumption of physical life) while already possessing a great good of an improved "afterlife". The problem is an epistemological one. Like scientists, I must have credible evidence and verification for what I believe. Not finding that in this matter, it is back to cryonics!

To succeed fast, we need an enormously larger membership. We must keep education material arriving to anyone who has indicated any interest. It takes long stretches of time for most people to make major decisions and changes in their lives. I have advocated and will continue to advocate, and will make donations for, free one years subscriptions to *The Immortalist*.

At some point we must address the matter of having a sales force. We have various things in common with the insurance industry. Everyone acknowledges that insurance is "sold, not bought". This is where preaching can be added to educating. Could life insurance companies make it without salesmen? One respect in which our salesman has an advantage is that we are appealing to self-interest, a necessarily stronger motivation than the altruistic one of benefiting others. In any case, the personal touch is needed not only to follow-up and to always be available to answer questions but also to close the sale of contracts.

My guess is that most fully funded cryonicists, consciously or unconsciously, consider their contract as "insurance". As the first but all important step in insuring against what my belief about there being no "afterlife" predicts for myself, I'd say that such prudent behavior is perfectly rational. Exactly what one would expect a practicing agnostic to say.

I think that in order to fully know an individual it is, in my opinion, necessary to know "some of his strongest beliefs, hopes and fears and even predictions". Before closing, I offer a major fear and a major prediction. The fear is that man, in his stupidity, may either greatly delay or cut off completely all hope of cryonics' success. This they might accomplish with nuclear and/or biological warfare.

My major prediction is that there will be an even greater revolution in the history of man preceding the cryonics revolution. This would be the "death of death" or what I call "The Immortality Revolution" for want of a better name. I think the problems involved in reviving those considered, at present, like cryonics patients, to be 'clinically dead" are more difficult to solve than those for extending our living presence indefinitely. Eliminating aging may be as easy as finding, for example, a "death gene" and turning it off.

Once there are no more natural deaths, I predict wondrous changes. Religions as we know them will fade away. People will become more moral. Wars will end. They will be more compassionate and will bring cryonics patients back and make sure we are "up to date". The world will become one nation with countries as states, the vision of the United World Federalists, whose meetings I attended as a college student, will come to pass.

What we have to sell, then, is of incalculable worth. For the cost of a luxury automobile, which carries us through local space, we can buy a cryonics contract which, when implemented, will carry us through time until medical science has all the tools to complete the job.

I end with a touch of humor and, regrettably, with a tragic note: My friend, Patrick Dewey, a fully funded cryonicist from the seventies, was fond of saying "Many are chosen, but few are frozen." Regrettably, he was not and I intend to spend the time after my retirement trying to insure that his fate is shared by as few of my fellow humans as possible.

Closing remarks by York W. Porter,
Immortalist Society President:

Hugh was a fine man and I deeply regret that he was not able to pursue his post-retirement plans. The cautions, however, in the last paragraph of the article above still ring true. If you have even a small interest in cryonics, begin exploring the subject today. Come to an annual meeting. Use e-mail, Facebook, and the other things available to many individuals worldwide today to find out more information. Use post office services or whatever reasonable means you can think of if that is all that is available to you. In short, don't delay. We need you and you need us. Join up with this effort today. You'll be glad you did.)

Cryonics Institute Membership Statistics:

As of July 2018, the Cryonics Institute has 1,594 members, up 40 from our last report. Of the 1,594 Members, 246 have arrangements for Suspended Animation Standby and Transport.

There are 173 human patients and 162 pet patients in cryopreservation at CI's Michigan facility.

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

CI MEMBERSHIP

MARCH 2019

* New Members = Increase in Membership since last issue

Members	1,594	Pets	168
Assoc. Members	195	DNA/Tissue	283
Patients	174	SA	246

TOTAL **1,962**

Worldwide Cryonics Groups

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

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

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

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

QUEBEC: Contact: Stephan Beauregard, C.I. Director & Official Administrator of the Cryonics Institute Facebook Page. Information about Cryonics & perfusion services in Montreal for all cryonicicts. Services available in French & English: **stephan@cryonics.org**

CHILE: Community oriented to provide reliable information on human cryopreservation, as far as technical scientific as well as other practical aspects. Dissemination, awareness and education on issues related to the extension of life in general and cryonics in particular. Contact José Luis Galdames via **galdamesjoseluis@gmail.com** or via Facebook at Crionica Chile.

FINLAND: The Finnish Cryonics Society, (KRYOFIN) was established in 2008 and is an organization collaborating with all nearby groups and organizations. Contact them at: **kryoniikka.fi** Their President is Antti Peltonen.

FRANCE: SOCIETE CRYONICS DE FRANCE is a non profit French organization working closely with European cryonics groups. For more information: J.Roland Missionnier: phone: 33 (0) 6 64 90 98 41 or email: **cryonicsnews.inpi@yahoo.fr** • **Facebook group**

GERMANY: DGAB There are a number of Cryonicists in Germany. Their Organization is called "Deutsche Gesellschaft für Angewandte Biostase e.V.", or short "DGAB". More information on their homepage at **www.biostase.de**. If there are further questions, contact their Board at **vorstand@biostase.de**

GERMANY: CRYONICS-GERMANY is an active group providing cryonics support, including a special 8-member Standby Response Team. Members from Germany or Internationally are welcome to join. at **http://cryonics-germany.org**. Direct inquiries to **contact@cryonics-germany.org**.

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

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

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

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

THE NETHERLANDS: Dutch Cryonics Organization is the local support group since 2002 and able to provide advice, standby, perfusion and shipment 24/7, in case of need. We are an active group utilizing the latest equipment. New members from The Netherlands welcome.

E-mail: **info@cryonisme.nl**
website: **http://www.cryonisme.nl**

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

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

SWEDEN: **www.kryonik.se** or Facebook: Svenska Kryonikföreningen. Initially, the society will focus on providing information and assistance to those who wish to sign up for cryonics. Eventually, we also hope to provide practical assistance in cases, possibly in collaboration with other European groups.

SWITZERLAND: **www.cryosuisse.ch**

CRYOSUISSE The Swiss Society for Cryonics is an active group with over 30 members. To join, **email info@cryosuisse.ch**

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

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

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

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

Please send any corrections or changes to the address below. If you know of, or are considering starting a support, standby or other cryonics-related group in your area, please send details to

dg@dgmedia-design.com.

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

The Tenth Annual *Young Cryonicists* Gathering

Teens & Twenties 10 2019: Getting to Know You - You Getting to Know Each Other

Fri-Sun; May 17-19, '19 Fort Lauderdale, FL Host: *Biomedical Research & Longevity Society* SCHOLARSHIPS

★★★

Greetings to *ALL Young Cryonicists*,

You are receiving this invitation because you are the future of cryonics.

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

Who is Eligible?

Fully signed up young cryonicists from all acknowledged cryonics providers in their late teens *through* age thirty *(18-30) as of May 16, 2019* - may apply to attend.

Younger Cryonicists With Parent(s):

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

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

Program

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

Enjoy this exciting & fulfilling weekend.

SCHOLARSHIPS:

Biomedical Research & Longevity Society, through a generous education grant, offers *40 scholarships* paying ALL of the following:

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

Please click on this website for a full packet with all details and application forms.

VIEW AND DOWNLOAD

Forever,

Cairn Erfreuliche Idun
Founder/Director: T2

PS Come Early. Stay Late.

Some attendees to T2 enjoy spending *extra time in Florida* - especially since their flight is already paid for via their scholarship.

This is at their own expense for additional lodging and food.

I look forward to getting to know you.

I'll Be Glad When You're Dead, Ned!

by Jim Yount

Introductory comments by York W. Porter, Immortalist Society President:

Jim Yount, my long time friend,has been on the planet, like myself, for a day or two. In the flower of my youth, aka the "Age of Aquarius", as the sixties were sometimes generically referred to, things were supposed to be a time of "peace, love, and brotherhood". Turns out they were, in some respects, much like other eras of humans on the planet, with the realites of conflict, dislike, and "leave me alone" sometimes ruling the day. One of my very favorite authors, Mr. Mark Twain, whose wisdom seems to transcend any era, has been quoted as saying "I have never murdered anybody, but I have read a death notice or two with deep satisfaction". Further, in addition to Jim, another close friend of mine in cryonics said one time that he had read that if we all knew exactly what each of us thought about the other, none of us would probably get along. It has been a blessing, I suppose, that telepathy hasn't yet been developed! Guess we'll have to deal with that problem if it ever comes along.

In short, folks frequently don't get along so well, in spite of the numerous admonitions by teachers, preachers, and other advocates of us all being "one big happy family". While I remain firmly on the side of the teachers, preachers, and advocates, and while I do have realistic hope for the gradual civilizing of our more primitive impulses over the decades to come, Jim's writings do remind us that we haven't reached that state yet and, with a fair amount, I believe, of "tongue in cheek" humor, he points out the possible effects to cryonicists of the more or less universal trait of humans to not so universally be so fond of each other.

There's this jerk at the office, a pain in the neck with a capital P. The kind of guy who seems to delight in other people's misery. The type of bad-to-the-bone motor scooter who kicks dogs and steps on kitties' tails just to hear them howl.

He gets it in for poor old Jeff Wheeler and plants a stash of hash in the old guy's locker, then calls the Super over and says he thinks Wheeler has been using on the job on account of the old timer's eyes are kind of red. So, security searches his locker and finds the hash. Wheeler gets canned, just two weeks before he would have retired with a company pension.

Well, that's the kind of thing Ned is pulling, pretty near constantly. He's made life a living hell for you and just about everyone else at the office just because he's a natural born horse's patoot.

After about the second week of putting up with Ned, you start thinking about getting even. Just punching his lights out or telling him off is not near harsh enough, not after what you've been through. So how about solving your own and the world's problem for good and all? Just plain out and out kill the reprobate. You know enough about him and his habits to pull it off, and even if some of the boys figured out that it was you, they'd never tell. They'd even give you an alibi if you needed one.

Most of us have known guys like Ned. It's unfortunate but true that there are individuals in this world who seem to delight in causing trouble for others, whether or not they will benefit from the misery of their victims. Most of us have enemies, people who just plain don't like us or who have done us dirt for their own personal advantage. And, it's human nature to want to strike back. I don't know about you, but I have a well-equipped torture chamber in my mind; I call it "Yount's Inferno." When wronged by one of these creeps, my chief torturer works them over pretty good. I even have a special V.I.P. chamber for politicians and petty bureaucrats where they are forced to listen to their own speeches over and over.

I also operate a "Pleasure Cruise" in my mind using my own yacht. Every once in a while, usually after one of Ned's brothers has had a go at me, I take my yacht out of dry dock and have a *bon voyage* party. I send airline tickets to *all* of my enemies inviting them to a free Pacific Cruise. In disguise I usher them all aboard, then set sail. For two days straight, they are their charming selves and make life miserable for each other with various dirty tricks. Then on the third day I reveal my identity, tell them all off, and board a speedboat which has been towed along for the getaway.

Amidst the jeering and cat calls I pull away I hear one of them yell "The *#%&* pulled the plug on us!"

Sure enough, the plug has been pulled and water is flooding in. I smile and wave goodbye as all of my enemies slowly sink into the Pacific.

The promise of heaven and the threat of hell is used by many major religions to enforce morality. But what about an atheist or agnostic? Are there any such nonreligious restraints on a victim of Ned's which might keep that victim from bumping Ned off? Let's add another factor to the equation. Let's say the victim is also a cryonicist.

There are restraints under the law, of course, but any smart cryonicist (aren't we all geniuses?) who has read a mystery book or two could figure out a way to rid the world of Ned without getting caught.

There are also some common-sense restraints. If you really start bumping

people off because they have mistreated you, where do you stop? Ned really deserves it. But what about the clerk who shortchanged you, then lied to his boss and got you thrown out of the store? How about the smart-aleck kid at the car wash who gave your wife a bad time, then threatened to sue you when you suggested he was no gentleman? When you start eliminating your enemies, where do you stop? Besides, maybe you have a bad day and tell someone who irritates you where to go and offer to show him/her the way personally. Do you yourself, then, fall into the "O.K. to kill" category?

Suppose you do murder your enemy. You do it in a "slick as shinola" fashion where no one in the world except you knows or even suspects who the real killer is. The perfect crime. You are free from your tormentor at last, and no one's the wiser. Conscience? Not on your life. Ned deserved to die.

So, you live out your life doing the things one does living out one's life. Every now and then your mind wanders back to Ned, the creep, and how he met his fate. When it does, a little smile lights up your face, and you feel really good inside. You take your terrible secret with you to your cryonic storage capsule. Then in 150 years or so you are reanimated to the wondrous world of the future! Right? Wrong!

The reanimation techniques used to revive or reconstruct you may be such that, of necessity, every one of your dark little secrets is known by those reviving you. Would future generations want a known killer wondering amongst them? Might there be laws which require screening out such desperados? Murderers might not be revived.

What about the predisposition to murder or violence? Will my own little torture chamber insure that I never walk the halls of the future? Is the writing of this article itself going to damn me? And where will *they* draw the line? Will only those with the purest of pure thoughts and deeds be granted the key to the kingdom of *FUTURE!* Is it likely that a double standard will be imposed by law? Will cryonauts be held to a higher standard of mental stability and morality than those born "naturally" into that time?

My own guess is that all of our nasty little secrets will indeed be known by future revivalists but this knowledge will have little effect on the decision to revive or not revive.

There may well be some psychological or physiological adjustments made to individuals to ensure that criminals are not being revived (even if criminals were frozen). However, such adjustments will be made anyway, either before, during, or after revival. The *fact* of our reanimation will indicate that the mechanisms to change the very nature of man are available. If available, they will surely be utilized.

There may be a short period of time when reanimation is possible but society is still ruled by laws made by the lesser-humans-we-now-are. Such pygmies might well impose self-serving and overly restrictive laws upon those who would reanimate us. If compromising information was obtained through historical documents (such as this article) or through some as yet undiscovered technique to retrieve information from our very brains, we might not be revived *then*. The question is: would our frozen selves make it through this period of barbarism to be revived by a later more enlightened generation? Every year we are on ice, there is a small but real danger of being thawed and buried. I think it likely that this danger would increase after the first few successful reanimations. The murderers, ne'er-do-wells, and thieves might just be incinerated on general principles.

What of the far future? Mankind might pass rather quickly from the age of barbarism to a period of super-science where mankind has changed so completely that the supermen of that time would have little motivation to bother with reanimating us. The resources available to these beings might be such that the money in our trust funds would be little inducement. If you have the resources and inclination to do such things as tear apart and rebuild whole planets why should you bother with a few thousand frozen bodies of your monkey ancestors?

Fortunately, there may be "pockets of barbarism" even in the far future. In our own time there is a vast gap between those of us who enjoy the fruits of technology and the people in some remote areas who are barely out of the stone age. It may be that the man or woman who kills Ned would be reanimated by the twenty second century's version of hillbillies.

The murderer of Ned might miss out entirely by first being passed over because of restrictive laws and then miss out because the middle period (the only period when the political and economic conditions would allow for his reanimation) was too brief.

Is there, then, a special kind of hell which threatens the cryonicist and acts to enforce morality? Is the possibility of being "judged by our works" and (be they evil works) never reanimated, an inducement to pass up that perfect crime and let Ned live?

Wasn't it P. T. Barnum who said, "There's a jerk born every minute"? That's not quite the quote, but it must be true judging from the number who are around. Partly because of the possible effect upon my own chances of revival, I won't cut even shorter their short, short lives (future Historians take note!); I will, however, keep a warm spot in my mind for them!

Bump off the jerks? Why bother? Since most of these heels haven't made arrangements to be suspended, they'll soon be dead anyway.

Determination

Introductory Remarks by York W. Porter, Immortalist Society President

This issue may turn out to be a semi-full edition of the "Looking Back" series that was suggested by our Vice-President Deb Fleming and that is so interesting to many readers. In looking through past issues of our magazine trying to find materials to use for the Looking Back column, I frequently come across impressive articles that are still very relevant for today. One such offering comes from the same May-June 1999 issue that Robert Ettinger's column that also appears in this issue came from. While the actual title of the article is "Adventures in Responsibility", I took some editorial liberty and titled the general column in this issue by using the one word "Determination". This seems, to me at least, to sum up the excellent writing that appears below. It is an excellent exposition on the one quality that has made cryonics what it is today and what each of us will need in order to help it succeed down through the years.

Robert Ettinger was himself an example of that single solitary word. In the early days of cryonics, coming as it did in the 1960's when moon rockets, high speed computers, organ transplantation, jet aircraft and other modern miracles of science were making their debut on the world stage, cryonics seemed to be just another step forward on the road to modern innovation and improvement. The publication of his book, The Prospect of Immortality, coupled with the enormous publicity and public discussion it generated, made cryonics seem as if it were a subject that would take off on its own. In my own case, as a young teenager growing up in the hills of Virginia, I thought by the time I got grown the whole endeavor would be well underway with no need or possibility of me even getting involved in things. Sadly that was not the case but Robert Ettinger's quiet determination to keep going when going had become more difficult than the optimistic early days has led to the progress we experience today.

In the following article by Gary Kline, that same outstanding quality of determination comes shining through. At the time of the article, Mr. Kline was a computer engineer and was living in Seattle, Washington. He had recently joined the Immortalist Society and was planning, at the time, to become a member of the Cryonics Institute.

In a recent episode of the "Dr. Phil" television show, Dr. Phil talked about how his high school football team scrimmaged one day with a team sponsored by the Salvation Army. The Salvation Army team arrived in various vehicles instead of a fancy bus. The SA team was dressed in very modest football gear and one young man playing for the Salvation Army side had used masking tape to form the number on his button up shirt

since it was the only shirt the young man owned and he would need it after the game. Dr. Phil went on to say how that his team, in the sometimes-condescending way of youth, pretty much discounted the SA team. This lasted until the first line up when, as Dr. Phil laughingly recounted, the young man with the masking tape on his shirt, hit Dr. Phil so hard that "it still hurts to this day". After the underestimated team with the Salvation Army's sponsorship thrashed Phil McGraw's team fifty something to nothing, Dr. Phil said he was left wondering "If they can accomplish so much with so little, what can I, who have been deeply blessed with so much, accomplish?"

It was a great question and I was reinforced in its import when I fortuitously came across and read Gary Kline's amazing and inspiring article from 1999. All of us that are interested in cryonics are needed in this important work. In my own case, I remain very mindful of my many shortcomings in helping to push this world-changing concept forward. In your own case, please read this excellent article and then reflect on how you can help push forward this important area of human endeavor as best you can. You don't have to "change the world" but just consider what talents you have and how they can best be used to further the efforts we are all involved in.

(Please note that the article here may have been very lightly edited for space and other considerations but a real attempt has been made to insure that the core of the article, and its excellent point, remain intact). The brief introduction by Mr. Kline precedes his excellent writing and starts just below. Please note that The Immortalist was the former name of Long Life Magazine.

The past and the present are but prologues to the new ending of this piece. I hope the article reads well and makes sense to the reader. Readers of **The Immortalist** are bound to be several cuts above the average reader. Likewise with the readers I will be pointing toward this piece through my BSDezine column. One of my aims is to interest hundreds or thousands more in cryonics in general, and in CI particularly. I hope this story helps.

Gary D. Kline`

Adventures in Responsibility

By: **Gary Kline**

Unless responsibility is circumscribed upon us, it probably doesn't come naturally to most. It certainly didn't for me. Not longer after I graduated high school, my father put it bluntly, "You're so irresponsible! I don't know what we're going to do with you. You have to buckle down and figure out what you're going to do with your life."

"Well, maybe college eventually, " was my lame reply. I had hated high school and wasn't looking forward to college even if it had been possible. It wasn't. Dad snapped, "You kow that Rehabilitation doesn't think college would make you employable. Because---". But he didn't finish. He meant because I was crippled. A word that was as obscene to him as the reality was to me.

I snagged my cane from the corner of the table, got up, and hobble into the dining room. "Maybe I'll get hit by a truck and save everybody grief, " I said, "I'm thinking that you can learn to do bookkeeping," Dad said. "You know that I'm not going to be around too much longer. And your mother won't live forever. If you don't buckle down and take responsibility for yourself, the State's going to put you in a home. Mark my words."

In the final analysis we are all responsible for our own success. What we'll eventually have is a direct function of our current hopes and dreams and plans. …It takes some of us longer to face up to this. College was beyond reach. My parents couldn't afford to send me out of state. Voc Rehab refused; my grades excluded any scholarship. A wealthy old maid aunt was paying for an older sister's college education. Aunt Myra refused to help me. It was commonly accepted that the handicapped be locked out of sight.

The only way that I saw was to get serious about my writing. Writing had been a strong point for years. I was still hoping for another brain operation to help my legs. Six neurosurgeries had made splendid medical history as far as my hands and arms were concerned. But the operations hadn't helped my legs that much.

In the next year or so, I wrote letters to my neurosurgeons asking him to do a seventh operation. "So I will be able to go on to college," I said. Dr. Nulsen couldn't understand why the Ohio Bureau of Voc Rehab was being so stubborn. He told me that he could think of any number of professions that didn't require the "abilities of a football player" as he put it. I didn't argue the point. I just kept asking for him to consider another brain

surgery to help my legs.

I was a virtual shut-in. The city buses had stopped running and we lived miles from anywhere. My dad saw no sense in letting me learn to drive. My workdays as a writer filled at least 6 hours every day, more than 350 days a year. Even when I finally began college. Short stories and articles and poetry, and novels. My successes were few but I stuck to it.

The seventh brain operation finally happened in January, 1964. The results were horrific. The surgery that was to rid my right leg of the constant muscular tension all but destroyed me. My entire right side was gone—rendered virtually useless—and my speech was significantly worsened. Torsion dystonia was considered the most stubborn and unresponsive of the neurological disorders. Dr. Nulsen had considered the first six procedures true miracles; this time there were no miracles.

Now I was faced with being confined to a motorized wheelchair, or crawling on my hands and knees—with difficulty. Or bedridden. Instead of surrendering to my worsened condition, I embarked upon two years of rigorous physical therapy. Daily, I dragged myself around the perimeter of our yard 20 times on crutches. Or 50 times from one end of the house to the other when it rained or snowed. I forced my right hand to re-learn to tie the work boots that were the only shoes to stay on my feet. I practiced reading out loud; and singing. Months were spent inside rehab hospitals near Cleveland.

Aside from re-learning to tie my shoes, there was virtually no improvement. My stamina increased, perhaps. My left hand and arm had been unaffected by the last brain surgery, and I made the most of the situation. I took a year of correspondence course college English from Ohio University during 1966, and again asked Rehab to pay for college. I could go right here in town I pleaded. The Mansfield Campus of Ohio State was recently finished and I could go there. Here. At least for the first couple years.

Rehab finally okayed it. They funded a motorized wheelchair and I spent two years getting the prerequisites out of the way. As for employability—well, that was something else. A psych prof told me that with a Master's in psychology I might be able to qualify for scoring tests. Certainly nothing else, since my speech was severely impaired and I was wheelchair bound. He really didn't understand what I was doing in college unless it was to make me feel better about myself.

I was an A+ student in every bioscience course I took. My neurosurgeon, Dr. Nulsen, assumed that I would become a physician. I wanted to pursue something in the bioscience field; certain parts of medicine interested me, but not enough to sustain me

through four years of med school. Physiology grabbed me, and genetics; and biology at the molecular level. But I wasn't permitted to take the requisite chemistry courses.

"I'm not having you fall over in lab and hurt yourself or anybody else," the head of Chemistry said. "And then have you sue the University. No. Absolutely not." I requested Rehab to send me out-of-state to finish my degree. Ohio had nothing for the disabled. In response, Mrs. McDermott brought her boss, a Mister Wheeler who had lost both hands in a farming accident, to dissuade me from trying to go further.

"Look," Mister Wheeler said, holding up his prostheses, "I dreamed of being a mathematician. But my profs proved I couldn't do it; I couldn't write fast enough with these." He shook his arms at me. "So I had to give up my dreams. I had to wake up to reality. And I suggest that you do the same. "Look. I can't write a story; but you can. So if I were you, I'd forget going on to college and stay home and write."

I grimaced at the thought of staying home. "Look. It's a fact. You are horribly handicapped, and I, being charged with the responsibility of looking out for spending the taxpayer's money wisely—I've got to make some hard decisions sometimes." He looked at Mrs. McDermott sitting in the chair beside him; then at my parents and me on the davenport.

"I'm denying your request that the Bureau send you to college out of state." And that was that. One day in the Fall of '74 I made tea for my father. He had been forced to retire from Sears some months earlier. It was evident that he hadn't much time left, and this afternoon, clinging to the wall to walk, I'd stopped by his bedroom on my way past. "Do you want me to make you some tea?" I don't know what made me ask, we rarely talked, or looked at each other. Dad nodded and I asked him to give me 10 minutes. In the kitchen I filled a hot pot with water, took two cups, tea bags, and got the tray from the sink. Putting everything on the floor and, crawling, pushed it into my old man's bedroom. There, I plugged in the hot pot and a few minutes latter we were having tea. It was the first time, and the last.

My dad began turning away when my disability had begun 20 years earlier. We hadn't exchanged more than a hundred words since I'd left college before. Even now the words were sparse. "I don't know what's going to happen to you," he said after a long silence. "I really don't. I just hope you make it as a writer because that's about the only way." "Yeah," I said. "I know. I'll keep trying; that's all I can do." "You've got your mother's brains, but you've got my perseverance. And you don't get nowhere without both of them." "I'm going to keep trying."

Suddenly, a smile broke through his pain. "Until you die with your boots on, even? Like me?"

I don't remember if I answered that; nor do I remember if he said father was was close to dying and in severe pain almost constantly. I remember pushing the tray with the empty cups back to the kitchen; no more. My father was taken by ambulance to Columbus not long after that. My mother went with him. One of my father's cousin's checked on me occasionally during the following three weeks until his death.

Through some serendipitous turns, three years later found me in Berkeley preparing to start college. A year after my Dad's death my mother and I had moved to the California desert. A trailer park near Palm Springs. Six weeks later I was on my way to study Zen in San Francisco; and after 19 months I left Zen Center to go back to school. The difference between Ohio's and California's philosophy on the education of the disabled was the blackest midnight compared to the brilliance of a desert noon. Batteries of examinations by the California Department of Rehabilitation showed that my mathematical skills were exceptional so I planned on a career as a tech writer. By Sheer and truly bizarre chance, though, I discovered computers. This serendipity delayed my entry into the University of California several months. For the good I think.

In 1982 I graduated with my electrical engineering degree. Subspecialty, computer science. At 37 I was ready to start earning my way. If you remember 1982, it was the heart of the worst economic downturn since the Great Depression, and jobs were hard to get. I had interned at Livermore Labs for nearly three years. This had let me pay some of my own way through school and had given me real-world work experience. Still, none of the larger corporations would hire me. I interviewed on campus and off, taking the BART train and buses to literally dozens of places.

"So, did you hear anything from IBM?" I asked my counselor one rainy day. Jim looked flustered. He backed his wheelchair away from the desk, wheeled over and caught the door, slamming it shut. "I don't think we're going to hear any new from Big Blue," he said. "At least not anything you want to hear." I was puzzled "I thought the interview went pretty well." "That's probably true. I've heard only good feedback from wherever you're interviewed. But with IBM, well…" Jim sighed. "I've heard this from several people so I can't discount it. IBM doesn't like to hire people with speech impairments. You can be paralyzed from the nose down but if you can do the job, IBM'll hire you. Big Blue likes to hire crips because it's good for the ol' corporate image. …" I heaved a sigh. "Just not me."

For close to 3 years I consulted. Consulting is what you do if you can't find a real job. It was brutal; living on the very edge. No health insurance; no insurance or benefits of any kind. I took BART and bus to many jobs over those months. I relocated twice because I couldn't drive and some jobs were hours away from Berkeley. Some jobs were only a couple weeks; some were total misfits; a few lasted several months.

In October, 1984 I got married. I was "between-between jobs" and managed to snag one in November or December. I was ready to accept virtually anything so that Bet and I would have a roof overhead, and managed to find work that lasted eight or nine months. It was slave-labor, really, but it kept food on the table until, through a USENET job newsgroup I found my first full-time position in northwest Wisconsin.

In the years since that first regular job, I have never worked for any huge corporation. No IBM or ATT, no Motorola, no Hewlett-Packard. Only small-to-medium sized operations or startups. By nature I'm a risk-taker, and this fits well with the ungodly long hours that startup companies demand. But I do my work, like everybody else. Put in my 50 to 60 hours a week and go home normally satisfied with my results.

This work is something that I'd never have foreseen in a million years. My interest in science dated from age seven when I was fascinated by The Atom. …My deepest love is still writing and in just the past several years I've gotten back to it. In '93 when a startup failed, throwing scores of us out of work, I took advantage of the time off to write the first novel in 17 years. After not having written save for editing and rewrite jobs during college, the story flowed onto the screen. The other day I found a few paragraphs that I'd written after taking a serious fall in '89. My right arm had shattered into 9 pieces; it was six months and several operations before the bone mended. I missed weeks of work, and to stave off total lunacy, filled hours writing in my journal.

On the unpredictability of life. We live at the mercy of Fate's caprice. Chance subtly shadows every step; with tiger-stealth. We cannot foresee a moment ahead as we trek through this forest of possibilities dappled with shade and light, clear and underbrush. Along this path, from the four directions, the unexpected will come. As death comes; as life and light and wonder come. The unforeseen lends dread and zest to this magnificent journey. At times serendipitous, occasionally tragic, though typically inconsequential, these twists and turns are predictably consistent. Change and chance signify life's rhythm and rhyme. Live ready for destiny; anticipating sunlight, prepared for shadow. The twists and turns that life takes wrought my next adventure with responsibility. Then Fate caught me by surprise in early March, 1995. Bet was late. I waved it off and kept formatting my novel. "You're periods have always been irregular." "Yes," Bet said, "but never this late. Almost two weeks." I stopped working and turned the wheelchair to face her standing in the doorway. "I thought only a few days."

She shook her head, smiled and made a cradle of her arms. Swayed then, back and forth and hummed. "It's not funny!" I said. Bet didn't say anything and I added, "You were always terrified of being pregnant, hon…" She nodded. "But I think it's finally happened, Daddy" "Bet I'm too old! I'll be 50 in two months, for Chrissake!"

"Well, that's what you get for doing it" I mumbled something and turned back to my work. I really wasn't that concerned. We'd had a couple false alarms before. Neither of us was that sure we wanted children; we left the decision something like: If it happens, it happens; otherwise it will just be the two of us. The pregnancy test the following Monday proved positive. I must've stared at the thin red line on the tester for 20 minutes. A small part of me felt warm and fuzzy; the rest of me felt like I was an overloaded mule that had just had a grand piano added to its load. I had kinda, sorta hoped to retire in the next five to seven years, somehow. Consult part time from home, perhaps. I could feel the years; it was starting to get noticeably harder to drag my bones out of bed. More aches and pains… . My disability hasn't changed much since the last brain surgery, but the natural wear and tear was beginning to take its toll.

---Yes, it was true that the past five or six months I'd been doing 90+ hour weeks. At work, plus volunteering for various public interest electronic organizations. Plus finishing my novel for electronic publication. By now it was clear that I was never going to be wealthy, and if I wanted to get some earnest satisfaction out of this existence it meant doing it after hours. ---At the same time, there had been times since we had moved to Seattle when I had spoken plaintively of not having a child. Maybe even just one.

I stopped working again, turned the wheelchair around again, and drove the few feet to where Bet stood beside the door. Opened my arms and she fell into them. We held one another for the longest while. Bet's pregnancy was extremely hard. From the beginning of the second month till the end she was nauseous and had a variety of other ills. Countless nights, I dragged myself out of bed and climbed into my wheelchair. Went into the bathroom and held her while she retched. I would have readily taken the nausea upon myself if I could have. Of course it wasn't possible. We have no choice but to endure our joys and sufferings ourselves. Just not alone.

We went through the entire 36 hours of labor together. At the end, our daughter was born into the world at just past 6 A.M. on the twelfth of November. Allyson has made these rugged decades worth it. Whenever I see my daughter every ache and sorrow disappears; only an ineffable happiness remains. I'm convinced that she is incontrovertibly the best thing that has ever happened to the universe. Even if I did have something to do with it.

Allyson has Bet's lovely eyes, nose and mouth; she's got my fingers and toes, and my square chin. Sometimes I can see the shadow of my face in hers; it brings a quiet joy; and fright. I hope that Allyson's determination matches mine. The 21st Century is hers and she's going to need grit and a strong will to prosper. Sometimes I do get wear of this game. Life is a game, a war game to be sure; but a game nonetheless. We're all warriors; symbolic and otherwise. How we fare in this theater depends large upon how lucky we

are, and how sharp. There isn't much that we can do with the hand that fate deals or the fortunes that befall us. Sagacity and will are other matters.

I hope that I'm able and in reasonably decent shape to see Allyson through college. If will plays any part in the matter, I'll be here.

Closing Remarks by York W. Porter, Immortalist Society President:

I couldn't help but close this beautifully written submission with a "tip of the cap" to Gary Kline's wonderful writing as well as one to my own daughter as well. She has been, as in Allyson's case, "the light of my life" and was a reason to keep going when things in life weren't going so well. Robert Ettinger was a father as well and although I never talked directly with him about the subject, I have sometimes wondered how much a father's love played in his unquenchable determination to move cryonics forward. Whatever the reason, he did so with great determination and effort and his efforts, as well as Gary Kline's writings above, should serve as an inspiration to us all to continue to work, frustrating though it may sometimes be, to bring the promise of cryonics to its full flower and fruition. Please throw your talents to the wheel today and join us in this wonderful effort.

Robert Ettinger: *The Legacy Continues*

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

Robert Ettinger on Nanotechnology & Cryonics

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

Robert Ettinger, as the "father of cryonics" initially offered his thesis with a basic "postulate". The postulate was that future medical science would be capable of reviving and repairing an individual who had reached clinical death and who had undergone the procedures associated with cryonics. As Mr. Ettinger later stated, he didn't know that the postulate was correct but, in view of the enormous advances in science up through the middle part of the twentieth-century, not long before he wrote his seminal book on the subject of cryonics, the postulate was a very rational one to make. When Dr. Eric Drexler brought forth to full fruition the field of nanotechnology, the postulate began to be made more specific and more clear by the probable ability of humans to develop tools that would work be able to manipulate substances at the molecular and atomic level.

In the writing that follows below, coming from the May-June edition of this publication from the year 1999, Mr. Ettinger gives an excellent introduction to individuals who may not be very familiar with the term "nanotechnology" or with its promise and capabilities. Referring to the works of Eric Drexler, Ralph Merkle, and others, Mr. Ettinger offers a very readable and logical account of how the postulate that he first wrote about is now much more clear and much more on solid ground.

Nanotechnology & Cryonics

By: R.C.W. Ettinger

An Introduction

Newcomers to cryonics—and even those not so new—often have serious gaps in their understanding of its relation to nanotechnology. Let me try to bridge some of these gaps by trying to spell out the main ideas simply enough for the intelligent but uninformed layman, yet with enough specificity and detail to begin to convince more sophisticated readers that we are not just blowing smoke.

The Meaning Of Nanotech

The prefix "nano" means "one billionth"—a nanometer is one billionth of a meter, or roughly a few times the diameter of a hydrogen atom. Nanotechnology therefore means, as a first approximation, technology on the scale of atoms and molecules.

But this is still pretty vague, and not exactly new. After all, chemists for centuries have attempted, often with striking success, to juggle atoms and molecules, to combine and separate atoms and to change molecules.

But they do it in bulk, while Nobel physicist Richard Feynman in the 1950s envisioned doing it with individual atoms and molecules, modifying or moving them one by one as needed, to do production and repair work (on any solid system, at least, although not excluding fluids) with ultimate precision. Actually, this wasn't totally new either, since our bodies do something like that all the time—enzyme molecules, for example, work by changing other molecules, one by one, while not undergoing any net change themselves. In other words, enzyme molecules can be considered tools, sometimes used to "saw" molecules apart or "nail" them together.

All this suggests that "nanotechnology" might also be called "molecular engineering", and that improves our mental picture, but it still falls short of capturing the diversity and potential of this new field. In the Eighties, K. Eric Drexler emerged as the leading guru of a much broader and higher vision. His projections included "assemblers"—nano-scale devices, or assemblages of nano-scale devices, which could build things in more or less the same way that biology can build things—by "growing" them, using materials from the environment. These assemblers could also assemble themselves—i.e., reproduce or replicate themselves, to make as many as the job requires.

This seems to suggest that the right machines could make almost anything out of air, water, or dirt—and do it dirt-cheap.

Pushing the concept further, the tiny-tech assemblers would be guided by tiny-tech computers, which could have varying degrees of specialization and learning capacity. Putting all this together, what do we get?

What we got more than 30 years ago (1966) was the movie *Fantastic Voyage* with Raquel Welch. A microscopic submarine, carrying surgeons reduced to microscopic size, was injected into a patient's circulatory system. Silly? Yes, if we are talking about Honey-I-Shrunk-the-Doctor. But if we are talking about microscopic robodocs swimming through your blood stream and burrowing through your tissues, that is not silly. They could work tirelessly to maintain or restore your health-removing plaque from arteries, killing and removing viruses and bacteria, replacing damaged DNA sections with normal sections, and in fact repairing or replacing any diseased, damaged, or missing cells or tissues, or even whole organs.

All this seems to suggest that we could wave our nano-wand to cure any ailment, disease, or trauma—including old age and freezing damage.

People are made of atoms and molecules. To restore youth and health, all you have to do is make wrong molecules into right molecules and get them to the right places. Simple isn't it?

Nanotech Momentum Is Building

Does all the above seem too good to be true. To many people, it did, and to some it still does. Stating a concept is not the same as proving its soundness; and even if a concept is sound in principle, its practical achievability must be demonstrated. Fortunately, progress in both theory and practice has been relatively rapid.

In 1986, the same year Drexler's *Engines of Creation* was published, two IBM physicists won the Nobel Prize for the Scanning Tunneling Microscope (STM)—the first of several devices that can "see" individual atoms, and even move them around. Research and development programs are under way or planned at Yale, Princeton, MIT, Caltech, Duke, Rice, Rutgers, Purdue; also at the universities of Chicago, Glasgow, Hamburg, Lausanne, Texas, Tokyo, Toronto, Washington, and dozens of others; at companies such as IBM, Xerox, AT&T, Dow Chemical, Exxon, Hitachi, Honeywell, McDonnell Douglas, Merck, and Zyvex; at national laboratories including, in the U.S., the Ames and Los Alamos, and Lawrence Livermore; by national agencies or departments such as the U.S. Army and Air Force, NASA, the National Science Foundations, the National Institutes of Health, and the Departments of Commerce and Energy. A British Parliamentary report stated that, by the year 2000 private corporate funding for nanotech applications will reach $80 billion.

For timely updates on progress, see the *Foresight Update*, a publication of the Foresight Institute, of which Dr. Drexler is chairman—web site at http://www.foresight.org. Or go to the links on the Cryonics Institute/Immortalist Society web site, http://www.cryonics.org.

Among cryonicists, some point to the promise of nanotech as evidence (not proof, but evidence) that it will become possible to revive, repair, and rejuvenate even the most badly damaged of our present and future patients. But others say "nanotech" should not be used as a mantra or as an excuse for complacency about our current freezing methods.

Both are right. We agree with the skeptics, that as little burden as possible should be placed on the future, and our patients should be frozen by the best methods we can learn or devise and have the capability to implement. But it is also obvious that patients frozen—for whatever reason—by cruder

methods should also have their chance, if that chance can be shown to be an appreciable one and not just a forlorn hope.

My aim in this brief discussion is to show a little of the evidence that the chance is, indeed, not a negligible one.

The FDA Allows Clinical Trials of Cryonics

One of the important names in nanotech theory is that of Ralph Merkle. When he gives one of his many talks introducing nanotech in its relation to cryonics, he says something along these lines:

In medicine, new procedures usually progress through various stages, including animal trials and finally human clinical trials. If the results of the clinical trials are good enough, the FDA may approve the procedure for routine use.

> *Patients are divided into two groups—the controls, who do not receive the treatment being investigated—and the experimental group, who do receive it. In the cryonics case, the controls are buried or cremated; those in the experimental group are frozen.*
>
> *Clinical trials of cryonics have been under way for many years, beginning in the Sixties when the first patients were frozen. The FDA allows this, because it thinks the patients are dead—and they are, legally. But the results of the clinical trials—for patients already frozen—will not be know for many years, decades or even a century or more.*

Although the outcome for the experimental group will not be known for sure for a long time, we do have a pretty good line on the outcome for the control group—those who were buried or cremated. So which group would you rather be in?

Numbers, Numbers, Numbers

Drexler, Merkle, and others have written at length on many aspects of cryonics-related nanotechnology, and in particular repair of freezing damage. Much of that is available on our web site. What I want to do right now is merely to convey a flavor of some of that detail, to begin to show skeptics that the investigation, although certainly still very preliminary—nevertheless endeavors to come to grips with reality and to provide hard answers to hard questions. Scientists and engineers tend to be more impressed by numbers than by qualitative arguments. So here are some nice numbers—selected, edited, abridged and paraphrased from works of Dr. Merkle and Dr. Drexler. References are omitted, but can be readily found on our website or its links.

Overview of the Brain

The brain has a volume of 1350 cubic centimeters (about one and a half quarts) and a weight of slightly more than 1400 grams (about three pounds). It is about 80% water by weight. An average brain has slightly over 100 grams of protein, about 175 grams of lipids, and some 30 to 40 grams of "other stuff".

How Many Molecules

An "average" protein molecule has a molecular weight of about 50,000 amu (atomic mass units; one amu is about the mass of a hydrogen atom or a proton or a neutron). One mole (gram molecular weight) of "average" protein is 50,000 grams (by definition), so the 100 grams of protein in the brain is 100/50,000 or .002 moles. One mole is 6.02×10^{23} molecules, so .002 moles is 1.2×10^{21} molecules.

The brain has about $175/500 \times 7.02 \times 10^{23}$ or about 2×10^{23} lipid molecules.

Water has a molecular weight of 18, so there will be about $1400 \times 0.8/18 \times 6.02 \times 10^{23}$ or about 4×10^{25} water (or cryoprotectant) molecules in the brain.

How Much Time

The more repair devices there are, the faster the repair will be. The more molecules there are, the more time it takes to repair each molecule, the slower the repair will be.

The time require for a ribosome to manufacture a protein molecule of 400 amino acids is about 10 seconds or about 25 milliseconds to add each amino acid. DNA polymerase III can add an additional base to a repeating DNA strand in about 7 milliseconds. In both cases, synthesis takes place in solution and involves significant delays while the needed components diffuse to the reactive sites. The speed of assembler-directed reactions is likely to prove faster than current biological systems. The arm of an assembler should be capable of making a complete motion and causing a single chemical transformation in about a microsecond. However, we will conservatively base our computations on the speed of synthesis already demonstrated by biological systems, and in particular on the slower speed of protein synthesis.

We must also analyze the existing molecules, possibly repair

them, and move them from their original location to the desired location. Existing antibodies can identify specific molecular species by selectively binding to them, so identifying individual molecules is feasible in principle. It seems reasonable to multiply the synthesis time by a factor of a few to provide an estimate of time spent per molecule. This should, in principle, allow time for the complete disassembly and reassembly of the selected molecule using methods no faster than those employed in biological systems. A factor of 10 should be sufficient. The total time required to move a molecule from its original location to its correct location in the repaired structure should be smaller than the time required to disassemble and reassemble it, so we will assume that the total time required for analysis, repair and movement is 100 seconds per protein molecule.

Total Repair Machine Seconds

We shall assume that the repair time for other molecules is similar per unit mass. That is, we shall assume that the repair time for the lipids (which each weigh about 500 amu, 100 times less than a protein) is about 100 times less than the repair time for a protein. The repair time for one lipid molecules is assumed to be one second. We will neglect water molecules in this analysis, assuming that they can be handled in bulk.

We have assumed that the time required to analyze and synthesize an individual molecule will dominate the time required to determine its present location, the time required to determine the appropriate location it should occupy in the required structure, and the time required to put it in this position. These assumptions are plausible but will be considered further when the methods of gaining access to and of moving molecules during the repair process are considered.

This analysis accounts for the bulk of the molecules—it seems unlikely that other molecular species will add significant additional repair time.

Based on these assumptions, we find that we require 100 seconds x 1.2×10^{21} protein molecules plus 1 second times 2×10^{23} lipids, or 3.2×10^{23} repair-machine-seconds. This number is not as fundamental as the number of molecules in the brain. It is based on the (probably conservative) assumption that repair of 50,000 amu requires 100 seconds. Faster repair would imply repair could be done with fewer repair machines, or in less time.

How Many Repair Machines

If we now fix the total time required for repair, we can determine the number of repair machines that must function in parallel. We shall rather arbitrarily adopt 10^8 seconds, which is very close to three years, as the total time in which we wish to complete repairs.

If the total repair is 10^8 seconds, and we require 3.2×10^{23} repair-machine-seconds, then we require 3.2×10^{15} repair machines for complete repair of the brain. This corresponds to $3.2 \times 10^{15}/(6.02 \times 10^{23})$ or 5.3×10^9 moles, or 5.3 nanomoles of repair machines. If each repair device weighs 10^9 to 10^{10} amu, then the total weight of all the repair devices is 53 to 530 grams: a few ounces over a pound.

Thus, the weight of repair devices required to repair each and every molecule in the brain, assuming the repair devices operate no faster than current biological methods, is about 4% to 40% of the total mass of the brain.

By way of comparison, there are about 10^{14} cells in the human body and each cell has about 10^7 ribosomes, giving 10^{21} ribosomes. Thus there are about six orders of magnitude more ribosomes in the human body than the number of repair machines we estimate are required to repair the human brain.

Errors in these estimates of even several orders of magnitude can be easily tolerated. A requirement for 530 kilograms of repair devices (1,000 to 10,000 times more than we calculate is needed) would have little practical impact on feasibility. Although repair scenarios that involve deployment of the repair devices within the volume of the brain could not be used if we required 530 kilograms of repair devices, a number of other repair scenarios would still work. Given that nanotechnology is feasible, manufacturing costs for repair devices will be small. The cost of even 530 kilograms of repair devices should eventually be significantly less than a few hundred dollars. The feasibility of repair down to the molecular level is insensitive to even large errors in the projections given here.

The "Information-Theoretic" Criterion of Survival

The least sophisticated criterion of "survival" requires retention of function. Most people today regard as "dead" someone who cannot function spontaneously—heartbeat and breathing, for example. Obviously, this is too simplistic, since many people—many thousands—have been revived after their hearts and lungs stopped working.

The next criterion is retention of structure. By way of analogy, if a wire is loose in an auto, it won't run—but obviously it isn't dead. Its structure is still 99.999% intact, and only a trivial repair is needed to restore function. Similar considerations apply to people. A slightly damaged organ may fail entirely to function, yet it is still only slightly damaged, and amenable to relatively easy repair.

So we get to the "information-theoretic" criterion. If we knew or can infer the information we need—what molecules, and where located, will represent a restoration and cure or repair of the patient—then, in principle, with advanced nanotech, we can repair and revive him. But some skeptics claim that frozen people are so degraded that essential information is irretrievably lost, and so is hope.

This pessimistic contention seems totally unrealistic, in view of the fact that many biological specimens have in fact been revived after warming from liquid nitrogen temperature; these include most types of human tissue, human embryos, some whole insects, and a few small mammalian organs. Rabbit brain pieces have shown coordinated electrical activity in networks of neurons—on and on. Still, can we yet be absolutely certain that some vital type of information is not lost?

No, absolute certainty in this—or in almost anything else, is not yet in our grasp. But there are plenty of reasons for optimism, in addition to those already mentioned.

For one thing, there may exist a Law of Conservation of Information, analogous to the Law of Conservation of Energy. Information can be lost (or created) locally, but not globally. Recent ideas about "quantum entanglement" tend to support this. However, space precludes further discussion here, except that we can make a brief mention of the jigsaw-puzzle analogy.

Putting together the scattered pieces of a jigsaw puzzle can be time-consuming, but it is basically easy. The pieces, after all, fit together in only one way. Over-simplifying just a little, we can say that the same is true, very nearly, of a frozen brain. There is only one way the atoms and molecules can fit together to restore the original configuration. (Actually, of course, most of them don't need to have their original locations known or restored, since a water molecule here or there doesn't matter, and housekeeping cells such as glial cells are generic, etc.) When you first start to put the puzzle together, there seem to be many possibilities for each piece, but as the work progresses the choices become fewer, and finally it becomes easy. The three-dimensional character of our brain puzzle makes it easier, since there are fewer possibilities of reasonable fit.

Another reason for optimism arises from thinking about cryptography and cryptanalysis—code or cipher making and code breaking. The difficulty of hiding information is stunningly impressive. Even when experts try their utmost to conceal information in codes or ciphers, and even in the presence of a lot of "noise" or random data bits, other experts frequently are able to break the codes. Now, recall that Dame Nature, while perhaps not exactly maternal, is not malicious either. She does not try to conceal clues, and perhaps cannot.

Recall also that Dr. Merkle, besides his prominence in Nanotech theory, is a recognized expert in cryptography. His belief that cryostasis patients have not suffered information theoretic death should be accorded corresponding respect.

Those who think the "random" movement of brain bits during freezing will destroy information have to contend with Dr. Merkle in another way also. There really isn't any such thing as "random" motion (except putatively at the quantum level), but one might claim that turbulent flow produces enough chaos to offer reason for pessimism. But Merkle has explicitly considered the question, displayed calculations (see our web site), and concluded that there is very little if any turbulent flow during freezing.

An Additional Approach to Information Retrieval

I have not seen the following suggestion in the literature, but it seems likely to offer further tools.

Instead of trying to work backward from the final, observed, degraded condition of a frozen patient, why not use computer simulation—under a wide variety of initial conditions and treatment regiments—to watch what would develop and what the intermediate and end results would be? The correlations should then provide strong implications about the initial state.

For example, we use treatment regimen A with initial condition of the clinically dead patient designed as A0. We run the computer simulation, with resulting conditions at subsequent times being A1, A2, ...and finally (say) the frozen condition An. (Each of the conditions A1, A2, ...will of course be a huge set of numbers showing all of

the critical or unique features of the brain in question.)

Now if we see an actual frozen patient closely fitting the de-

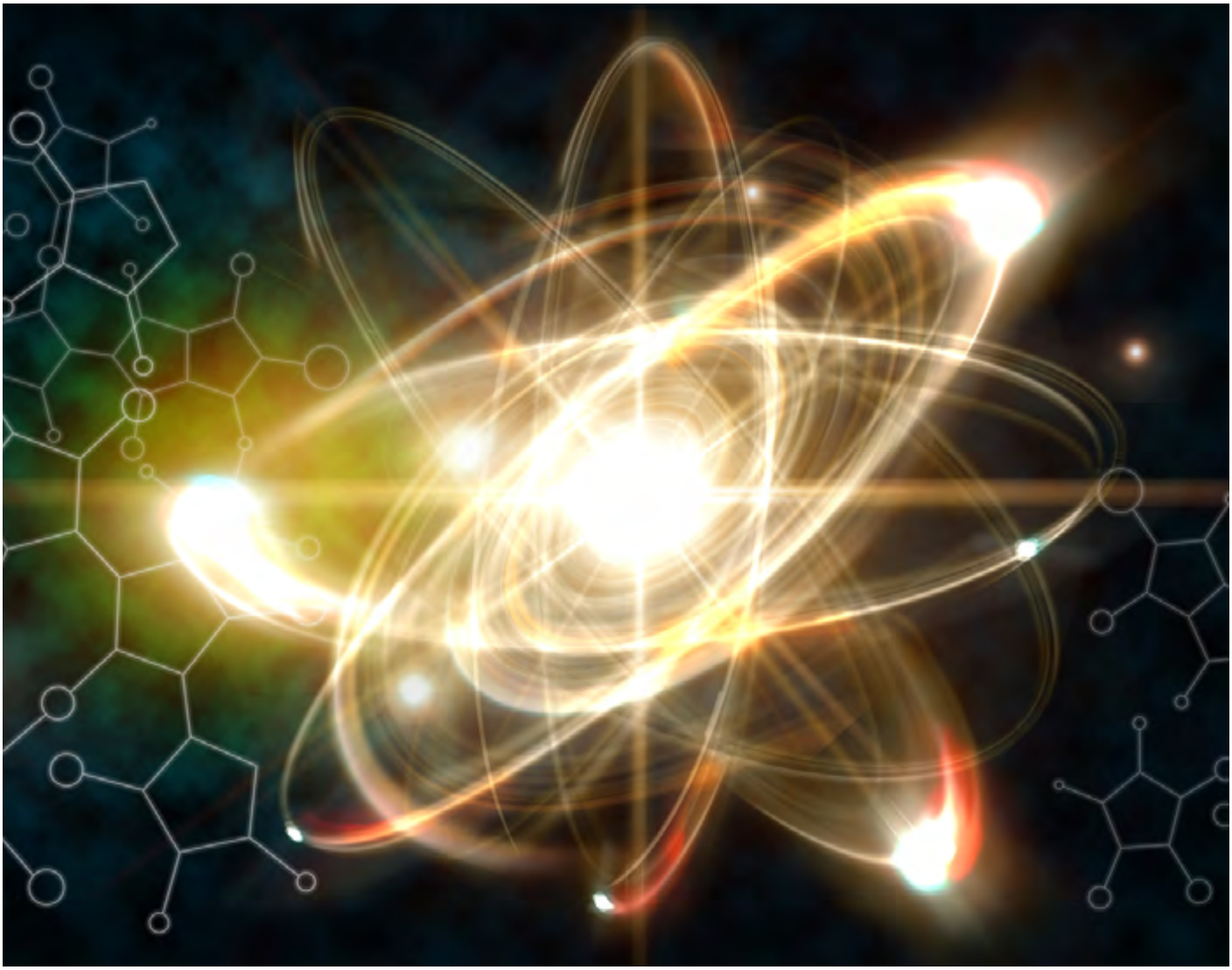
scription of An, we can infer that his initial condition was probably close to A1. Then additional clues from other sources might allow us considerable confidence as to what we are trying to regain—which memories, for example.

Needless to say, this approach would involve a staggering amount of computation, far beyond present capabilities, and it would require advanced brain scanning methods to provide the data input. But future computational resources (perhaps including quantum computation) are indeed very widely expected to represent tremendous advances—and the frozen patients can be patient.

And A Final Word About Optimists Vs. Pessimists

When you listen to can-do experts and can't-do experts, whom should you believe? Other things equal, it is no contest—the can-do person wins hands down, and the reason is extremely simple. The can't-do person has merely looked at the question and formed a pessimistic conclusion and turned away; or in a few cases perhaps he has actually tried to do it and failed and given up. The can-do person, on the other hand, *wants* to do it and keeps on trying, and if one approach fails he devises a new approach, and he doesn't quit.

Henry Ford said: "Some think they can do it. Some think they can't do it. They are both right."



the american cryonics society

cryonics society

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 which 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 it's 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 which 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-waitreanimate. We support cryonics research, education, and information dissemination. That is what ACS is about. That is ALL ACS is about.

Website: americancryonics.org

Email: cryonics@americancryonics.org

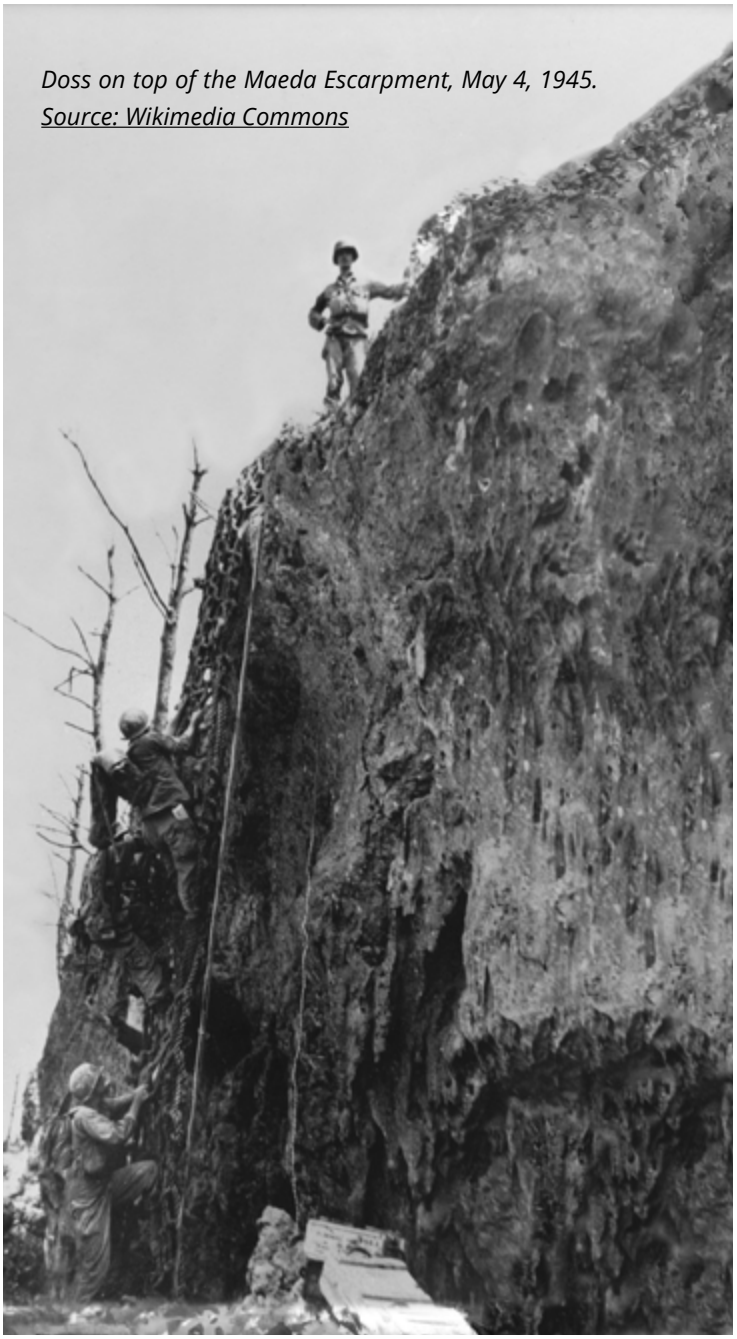
Phone: (408) 530-9001 • Toll-free: 1-800-523-2001.

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

The ACS office is located at 510 S. Mathilda Ave. (Mezzetta Bldg), Suite 8, Sunnyvale, CA 94086
Office hours are irregular.
An appointment is required for a personal visit or interview.

Final Thoughts

York W. Porter - Executive Editor



Doss on top of the Maeda Escarpment, May 4, 1945.
Source: Wikimedia Commons

A Matter of Conscience

All of us, I suppose, like to look at ourselves as persons of conviction. I believe that somewhere in the Bible, it states, "Every man is justified in his own mind". That means, of course, that all of us think that whatever we're doing, it is the "right thing" to do no matter, I suppose, how right or wrong what we're doing may be compared to some hypothetical universal standard or even, I suspect, when we know deep down inside that our actions don't exactly match ethical standards that we may have been taught while growing up and that we might actually truly believe are superior to the ones we're practicing at any one point in time. As I believe St. Paul basically stated "I say one thing and do another". True of all of us, I guess, being the less than perfect creatures that we are.

Another handy development in modern life in general is that, in many circumstances, it is very seldom that our convictions cost us very much at all. In the case of President Trump, for instance, I have friends who are staunch supporters and other friends who are staunch opponents. This has been true of every President (and politician for that matter) that I can remember. Other than sometimes-raucous discussions around the water cooler or over the dining room table, it really doesn't amount to much. It also, I suspect, doesn't really settle much either when it actually comes time to vote. Many of us use arguments as a drunk uses a lamppost, as more of a source of support rather than one of illumination, pick-

ing out those things that suit us and discarding those things that don't. (Yes, dear reader, I don't know about you but I am sadly "guilty as charged" on this point, and have been guilty on more than one occasion).

In my own life, my finding out about cryonics at an early age resulted only, at worst, in some folks thinking that I was, perhaps, a little odd. One early follower of Robert Ettinger, "the father of cryonics", told me personally that, at first, they thought "Well, he's a little cracked". They later became one of his most ardent supporters, working tirelessly down through the years to help push Mr. Ettinger's world changing concept forward.

Still, one wonders just how far one would go in the support of one's beliefs. In the case of one American soldier named Desmond Doss who served, as Robert Ettinger did, in the U.S. Army during the tumultuous days of World War II, Doss' belief against the taking of human life, was a matter of conscience which put him under more ridicule and disapprobation than I'll ever experience in a lifetime of supporting the cause of cryonics.

It all began with his birth on February 7, 1919, roughly four years after the birth of my own father and the same year as the birth of my mother and shortly after Robert Ettinger was born. They all were destined to be members of what Tom Brokaw has labeled, "The Greatest Generation", facing, as they would, the perils of both the many deprivations of the Great Depression, and the very real and life-threatening perils of World War II. They went on to help further build the modern world and did so, as Brokaw said, since in their eyes "... it was the right thing to do". As just mentioned, Robert Ettinger, the "father of cryonics" was a member of this group of the "Greatest Generation" as well and, knowing him as well as I was so fortunately able to do, I can assure anyone that cares to listen that Mr. Ettinger's motives in advocating cryonics were indeed the same. He didn't do it for money or fame or any other self-serving reason but, to him, simply because it was definitely "the right thing to do".

Desmond Doss was faced with a dilemma of great personal import when the United States entered World War II. The attack on Pearl Harbor had galvanized many Americans and had fundamentally ended the debate, which raged before Dec. 7, 1941 as to whether the United States should enter the conflict which had raged in Europe and elsewhere for several years before.

Given the attack on his country, which seemed to be unanswerable without military action, and his own personal beliefs against taking human life, the contradiction seemed, at first glance, to be unsolvable. The solution he came up with, to serve as an Army medic without carrying a weapon, was certainly an unusual combination at first glance to anyone that was going to be going into a zone of fierce combat and extreme personal physical danger. Doss referred to himself as a "conscientious cooperator" as opposed to a conscientious objector, perhaps further muddying the waters.

Doss' personal life certainly didn't seem to lead to a career in medical service of any kind. He had worked in a lumber company during the Great Depression to help support his family. Before World War II, he had worked in the famous Newport News, Virginia shipyard as a joiner. His work there would have entitled him to a military deferment and would have solved the whole situation without Doss being placed in any danger as a soldier in combat would have to face. Doss didn't think that was good enough and, on April 1, 1942 he entered military service. It was then that his initial troubles began. In addition to his beliefs against the taking of human life, he also was a Seventh Day Adventist and put in for a weekly pass so he could attend church every week.

The combination of Doss' two beliefs seemed to many of his fellow soldiers, just way too much to deal with, especially given the circumstances of men preparing for war. Doss was bullied, ostracized and even physically threatened. One of his fellow soldiers told Doss that after they went into combat, the fellow soldier would make sure that "You'll never make it out alive". Doss' commanding officers didn't exactly help the situation, perhaps since they were faced with attempting to train American troops in the brutal art of war, while Doss stood in the midst of some of those same troops with an adamant belief against carrying a weapon. Some of those officers made life for Doss as uncomfortable as they could as well. It was the sort of "times that try men's souls", to steal a phrase from Thomas Paine.

But Doss simply persisted in his efforts. Sticking to his personal beliefs in spite of all the problems it was causing him, Doss finally shipped out with his troops. One of his fellow soldiers talked about the harassment Doss underwent and said, in part, "He hung in there regardless of what they said or what they did."

And it was good for his fellow soldiers that he did. When the "chips were down", Doss proved himself to be 180 degrees different from what they expected. One of his commanding officers said that Doss was "one of the bravest persons alive"

and totally different from what the officer expected. Doss was so different that the officer, Jack Glover, wound up having his life saved by the man he originally wanted transferred out of the unit. Doss went on to serve with distinction, receiving the Bronze Star for his actions on Guam. Later, for his actions in the region of the Maeda Escarpment on Okinawa, in a situation in which two-thirds of his fellow soldiers were dead or wounded, Doss became one of only 431 individuals out of the 16 million in uniform in World War II who wound up receiving the Congressional Medal of Honor. The Medal of Honor had been initially established in the United States Civil War under then President Abraham Lincoln.

Finally removed from combat due to numerous wounds, including receiving a sniper's wound to his left arm which left that arm temporarily useless, Doss was at the White House on October 12, 1945, not long after the cessation of all hostilities in World War Two. Then President Harry S. Truman, who had served during World War One in an artillery unit, shook his hand and told Doss that Truman knew that Doss really deserved the honor being bestowed. Truman went on to say that he (Truman) considered receiving the Medal of Honor as a greater honor than being President of the United States. At the one hundredth anniversary of the Medal of Honor, Doss was chosen by his fellow recipients to represent them at a White House ceremony where he was able to have a chat with then President John F. Kennedy, a World War Two veteran himself.

Corporal Doss receiving the Medal of Honor from President Harry S. Truman on October 12, 1945. *Source: Wikimedia Commons*

Doss paid the physical price of his actions and his beliefs in a personal way as the combination of his wounds as well as a case of tuberculosis he had contracted due to his combat weakened condition left him with a 90 percent disability. He was basically unable to be gainfully employed after the war was over. Medication given to him in 1976 left him deaf although he benefited from a cochlear implant a few years later. Surgery at one point due to his tuberculosis resulted in the removal of one lung.

Even if one discounts the "Hollywood" embellishments (which were surprisingly few) in the relatively recent film *Hacksaw Ridge* about the exploits of Desmond Doss, the historical story of Doss remains quite remarkable. That same historical story also remains deeply incredible and deeply moving. It is, at bottom, the tale of a soldier who believed he was right and held his ground, no matter what.

In another soldier's tale, Robert Ettinger, having developed the concept of cryonics, had the courage of Doss in simply standing by his convictions. Through good years and bad, optimistic years and ones in which things weren't so optimistic, Ettinger "stayed the course" and never wavered in his efforts to push forward his idea solely for the benefit of his fellow humans and himself.

The same opportunity exists for you as well. No matter what your talents, begin to think of how you can use them to push this outstanding concept forward. Just have the "courage of your convictions" and ask yourself every day, as Doss and Ettinger did, what the "right thing to do" is, as regards this wonderful concept, and then move towards it. Join us in this effort today. You'll be very, very glad you did!

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