Dennis Kowalski - CI President

I have great news to report! The Cryonics Institute has exceeded expectations and growth and we are now the largest cryonics provider in the world, leading the way in affordable whole-body cryonics. I think that we should be proud of our accomplishments in this area and not be afraid to promote what we are doing well. At the same time, we must realize that our membership gains pale in comparison to the larger majority of people who are not signed up for cryonics. There are 7.5 billion people out there who have not chosen cryonics, so even with over 1,500 members we definitely have our work cut out for us.

Looking back at what we do well versus where we need improvements is an important step in realizing our goals. We have to take stock in what works and avoid what doesn’t.

What have we done well at CI?

I think affordability is a large part of our success. Over the last 40 years we have been able to balance our budget efficiently, not by raising prices or dues, but by cutting spending and realizing economies of scale. We are always looking for ways to do things more efficiently and we pass those savings on to you, our members. The trap of spending money on frivolous or nonessentials is strong everywhere. We see this in family budgets all the way up to those of the government. Certainly organizations like ours are not immune. It is easy to get nicked and dimed to death, but CI has thus far resisted the temptation to get caught up in unnecessary spending. It would be easy for CI to boost prices and spend money on endless side projects or excessive salaries. In fact, labor costs can be the single largest expense in running a business.

We have strategically kept our paid work staff to a functional minimum while utilizing enthusiastic volunteers when needed. We hire people to do work based on each job at hand and not simply for the sake of having extra staff. There is no benefit to
having to pay a bunch of people to stand around looking for things to do. At CI we have enough people working to get the job done - no more and no less.

CI is fiscally conservative and it has paid off. Every dollar we save is another dollar that you have. You can use these savings either to sign up more family members or to use on your very own standby. Whether you use your money to invest in your own local standby or organizations like SA or Cryonics UK, you have a choice. You are not bound into a one-size-fits-all cryonics plan. I think most people with common sense see that CI is a substantial and capable company that can provide some of the highest quality services anywhere at a very reasonable price.

Regarding pricing, some people believe that we currently don’t charge enough. For forty years we have been proving these people wrong. We are simply just that good at what we do. When you look at CI’s spending vs our income ratio you can see that even though we do not take in as much as other companies we are extremely efficient, and that’s what makes the difference. This is a key economic indicator in long term survivability. The ability to stay within budget is a critical requirement for being able to last decades or even centuries into the future. We are proud of our record of financial stability, service and continuous growth and improvement.

What do we need work on at CI?

I say it every issue and I will say it again here. The major weakness in cryonics, not just at CI but with all of cryonics, is standby. Go ahead look through the case reports or ask anyone with case experience... “What are the greatest problems facing people who want to get suspended?” The biggest problems are apathy and inertia. We put things off. We procrastinate. People think they can sign up and all their problems are over. Some people think that all they have to do is tell their family and provide some funding upon death. Some don’t even sign up in advance and then it’s too late when they need our services. Without membership and contracts in place there are inevitably crucial delays and roadblocks to suspension.

Some people let their proof of funding lapse, and this also results in unneeded delays.

When some people sign up they can be reclusive or quiet about their involvement in cryonics. They may not wear identifying bracelets or necklaces or carry wallet cards. These items bring attention to your wishes when you can’t speak for yourself and let EMT’s and surviving family members know about your plans to be preserved with CI. But if no one at CI knows you are sick or even deceased, it’s impossible for us to help you. This is why we have standby manuals and encourage members to do some basic planning and preparation in advance. We can provide you with quality assistance and save you a lot of time and money, but ultimately, only you can make the correct plans for your own situation.

If you haven’t done so already, please make sure your paperwork is in order. Make sure your funding is in place and start reading our standby materials to get a better understanding of the process and
preparations that are required. If you don’t take these simple steps now, then you are truly rolling the dice and your odds aren’t going to be nearly as good as if you had just invested the time to make even the most basic preparations. Please act now not later.

In other news, some very promising and exciting advances in cryobiology have been reported. Scientists developed a new way to safely thaw frozen tissues with the aid of nanoparticles. They produced and used silica-coated nanoparticles filled with iron oxide, which were then infused into tissues before chilling them to cryogenic temperatures. Later, the researchers used a magnetic field to warm frozen biological tissues infused with these nanoparticles. The tissues warmed rapidly and uniformly at about 10 to 100 times faster than previous methods. The samples were warmed as fast as 260°F or 130°C per minute. What happened? None of the rewarmed tissues displayed signs of harm from the heating process, and they preserved key physical properties such as elasticity.

Moreover, the researchers were able to wash away the nanoparticles from the sample after thawing. Tissues tested were human skin cells as well as pig heart valves and arteries. Most importantly, the tissues tested were larger in size (up to 50mm) than the relatively small (1-3mm) samples used in previous experiments. The larger tissue sample size holds out hope that eventually these processes will be applicable to whole organs and eventually whole bodies.

This is very interesting indeed and is something that we will be looking at more closely in the future. While this process doesn’t stop damage when going from warm to colder cryogenic temperatures, it does significantly help when going from cryogenic to normal temperatures. Most of the damage from ice crystallization happens during this transitional warming phase. Perhaps a combination of lower concentration cryoprotectants and these new nanoparticles could open the door to organ cryopreservation as well as improved lower toxicity cryonics procedures for our patients. These type of breakthroughs certainly do not hurt us as they bring conventional cryobiology further down the road from preserving simple tissues to trying to stabilize more complex organ systems.

In closing, I invite you all to make plans now for the 2017 AGM. Please see the AGM article in this issue of CI magazine for all the details.

Hope to see you all there!

Respectfully,

Dennis Kowalski - CI President
CI NEWS
What’s happening at the Cryonics Institute

We are pleased to report that we’ve been very busy here at the CI facility as a result of our organization’s continuous growth. Here is a quick look at what’s new at CI and in the world of cryonics!

High Demand for Standby Kits

CI has been hard at work assembling and delivering a number of intermediate standby kits for interested parties. This is a very exciting and encouraging development that shows members are taking the initiative for their standby arrangements and preparedness. We are happy to help by making these kits available and are glad to see increased interest in the kits. For more information about the standby kits, please visit:

http://www.cryonics.org/resources/ci-standby-kits-and-instructions

New Cryostats in the Works

CI has just completed the testing phase of two new cylindrical cryostats. The next step is to fireproof and paint the cryostats before they are put into position for patient use, which will be completed soon. We currently have one vacant cryostat in position, ready for the next 6 patients, bringing the total to 21 cylindrical cryostats and 3 rectangular cryostats in the storage area of the facility. The two newest cryostats will accommodate another 12 patients once they are put into place and will increase the cylindrical cryostat count to 23. Once these two cryostats have been moved into the storage area, another order for 2 more cryostats will be placed, as we are constantly preparing for the expansion of CI.

CI in the News

Sharisse Thompson, a TV Reporter at WEYI NBC 25/WSMH FOX 66 in Flint, MI recently visited CI to shoot a video segment for the station’s nightly newscast. The video can be seen here:

https://www.youtube.com/watch?v=Rv1T0Zlg1A4

It’s also currently the featured video on CI’s home page.

Watch for the several instances where the camera zeroes in on our signage and logos throughout the video...a great example of our facility improvements paying off with public relations dividends.
CI NEWS
What’s happening at the Cryonics Institute

PROOF OF FUNDING REMINDER

CI requires our funded members to provide proof of funding annually. We do this in order to ensure your eventual cryostasis can be performed without any delays or issues. Problems with proof of funding can delay cryopreservation by days or even weeks, so it is critical we have your up-to-date records on file here at CI.

There are three strategies to how you set up your funding.

1. PREPAY: If you have sufficient funds and can pay your preservation fee in full up front, you obviously don’t need to provide annual proof of funding.

2. CO-OWNER LIFE INSURANCE: If you are using an insurance policy, and you add CI as a co-owner to your policy, the insurance company will send us the same proof-of-funding statements you receive annually. We recommend this option to members as the easiest and most convenient way to ensure CI receives your required annual proof of funding.

3. SINGLE OWNER LIFE INSURANCE: Finally, if you are using life insurance but prefer to remain the sole owner of the policy, you will be required to mail or fax a copy of your annual statement to CI to prove that your policy is paid up, in force and up-to-date. We schedule your annual Proof-of-Funding update to coincide with your signed contract date, so if you signed your CI Contract in May, we would expect your proof of funding to be submitted annually each May. However, if you prefer to set a different date, or even want to send it in today that is perfectly fine. The important thing is to be sure you provide us this important information every year.

Cryonics Pioneer Edgar Swank becomes CI’s 147th Patient

On January 12, 2017 long-time cryonics activist Edgar Swank, age 76, became CI’s 147th patient. Details of Edgar’s cryopreservation are given in CI’s patients report (www.cryonics.org/case-reports/t-1). What is not mentioned in the report is that Edgar “overfunded” his cryopreservation by contributing about twice what CI requires. He also provided extra funds to the American Cryonics Society. For those who can afford to do so, such donations can have a big impact on the operations and financial stability of organizations like CI and ACS.

Edgar was a Founder, member, and officer of the American Cryonics Society where he served as a Governor, Secretary, Treasurer, Vice President, and President.

He was also among the founders of Trans Time, where he served as a Director and Vice President. He was also a Director of the Immortalist Society.
2017 TEENS & TWENTIES CONFERENCE

40 Scholarships Available!

Young Cryonicists are invited to attend the 8th annual Teens & Twenties Conference, Friday-Sunday, May 26-28 in Deerfield Beach FL. The event is hosted by the Life Extension Foundation and is open to fully-signed up cryonicists aged 18-30. Younger cryonicists (13-17 year olds) are welcome to attend with a parent or guardian.

SCHOLARSHIPS

Life Extension Foundation, through a generous education grant, is offering 40 scholarships that pay for US airfare, hotel accommodations, meals and beverages and the registration fee:

Full packet with all details and application forms here:

RAADfest Announces 2017 Dates

August 9th-13th | San Diego, CA

The Coalition for Radical Life Extension will be hosting the second annual RAAD Fest August 9-13, which promises to be the largest gathering of radical life extension enthusiasts yet. RAAD Fest combines the energy and fun of a festival, the empowerment and interaction of personal development, with cutting edge science presented for a lay audience to create the first and best holistic radical life extension event ever.

The festival will feature top scientists, entrepreneurs and thought-leaders who will be addressing every aspect of radical life extension, from nutrition and new gene therapies, to the power of personal intention, the sociology of immortality and advancement in artificial intelligence. Interactive presentations featuring scientists, speakers, activists, and enthusiasts, will be happening Wednesday night, Thursday day, Friday day, Saturday day, and Sunday half-day.

Everyone interested in the newest life extending science and super longevity strategies in invited to attend. Transhumanists, radical life extension enthusiasts, immortals, physical immortals, those interested in cryonics, and even people just looking at living the healthiest lifespan possible are all invited.

There are also spots available for Exhibitors and Sponsors interested in reaching this unique and enthusiastic demographic.

For more information, please visit www.raadfest.com
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Mark your calendars and reserve the date - Sunday, Sept. 10, 2017 for the Cryonics Institute's Annual General Meeting.

Please note, the 2017 AGM marks a change in venue from past meetings and will now be hosted at the ConCorde Inn in Clinton Township, MI, not at the CI Facility.

We will still be conducting tours of the CI facility prior to the meeting but the meeting itself will now be held at the new location, starting at the normal 3 p.m. time. So be sure to arrange your schedule accordingly if you’ll be taking a tour prior to the meeting.

Dinner arrangements are still being worked out, so be sure to watch for those details in future issues of the CI Newsletter.

Please note that reservations for rooms at ConCorde are on a first-come, first-served, so please book your reservations as soon as possible. Of course, if you can’t get a room at the ConCorde, there is other lodging available, but it would be preferable to have the majority of our group staying “on-site” at the hotel for convenient socializing and camaraderie before and after the official meeting agenda concludes. We have the room booked until 7 p.m., so there will be plenty of time to get to know your fellow members, speak to Directors and relax. After that, there is also a lounge available and other public areas where folks can gather if they like.

The ConCorde features an impressive meeting room, an outdoor seating area adjacent to the hall, plus a lounge, pool & fitness center and other amenities we’re sure everyone will enjoy. ConCorde Inn’s website is http://www.concordeinns.com.

CI’s AGMs is open to the general public, but we request that we be informed if you wish to attend. The annual meeting offers an excellent opportunity to see the facility, listen to guest speakers, meet other members from around the world, get updates on the Cryonics Institute & Immortalist Society and to see Officers, Directors & Staff.

For driving directions, more meeting information and to confirm attendance, send e-mail to CIHQ@aol.com or phone (586) 791-5961.

Night Before Dinner: CI members & the public are welcome to join us the night before the official CI AGM at Ike’s restaurant for a casual dinner and drinks. (Includes Vegan options.) We will meet Saturday, September 9, 2017 at 6pm at Ike’s Restaurant, 38560, Van Dyke Avenue, Sterling Heights (MI) 48312, near the Cryonics Institute.

For more information & directions: http://www.ikesrestaurant.com/location.php
Robert Ettinger: The Man Behind the Legend

Who was Robert Ettinger? Many cryonicists, both new and veteran have heard the name of “The Father of Cryonics,” likely read his seminal work “The Prospect of Immortality,” and are all indebted to him for his pioneering work creating a science, a movement and the organization we belong to today. But how many of us have had the opportunity to get to know the man behind “the legend?”

Longtime CI member and Board Member Joseph Kowalsky was there in the beginning. We recently asked Joe to share some of his personal insights and recollections of Robert Ettinger and the beginnings of the Cryonics Institute.

INTRODUCTION -- MARCH 2017:
It seems like a moment ago that I was sitting in Robert Ettinger’s living room in Michigan with his dog Mugsy and longtime CI member Chrissie de Rivaz, only yesterday that I was with Bob and Mae Ettinger out West (where they lived in the warmth for several years) with my wife, and a mere few days before that that I sat on a bar-stool-type chair at a meeting of the Cryonics Institute / Cryonics Society of Michigan at (Bob’s son) David Ettinger’s home in 1981. So how can it be over 6 1/2 years since I had the privilege to speak about Mr. Ettinger at the 2011 Cryonics Institute Annual meeting, a few months after he was placed in our care until such time as, if things go well, he can be revived?

The idea of time as a flow that need not be moving always in one direction -- non-linear time -- seems more understandable to me as I get older. Although time as we live it flows forward, I would like to take you back 6 1/2 years to that Memorial Service at the 2011 Annual Meeting.

Several other people spoke at that meeting. His son David spoke and, as I said at the time, my words, thoughts and feelings were but a shadow of his. Still, I hope that my perspective – at age 13, I was the youngest person outside of the Ettinger family to become affiliated with CI -- might help you to know a man who profoundly influenced my life for over 30 years. Beginning as a legend, he later became a friend, mentor, host, guest, and occasional intellectual sparring partner.

Excerpt of Eulogy of Robert Ettinger by Joseph Kowalsky
Given at Cryonics Institute Annual Meeting September 2011

To us, Robert Ettinger is the Father of Cryonics. To David, he is his Father – “Pop.” Thank you, David, and to the other members of Bob’s family, for sharing him with us for so long.

At 15 years old, in the early 1980’s, I met a hero of mine, Robert Ettinger.

He was REALLY old at the time – nearly 63 I think – and I
was scared to death. He was not one for small talk and that did not help. But how does one talk to a legend? Of course, his view of himself was more matter-of-fact. Robert Ettinger just did what he had to do.

When Bob was young he was seriously injured fighting in WWII. As he lay in the hospital recuperating for months he thought about science fiction stories that he had read. And from one of those stories he thought about Cryonics. In his early 20’s then, he assumed that Cryonics would be a reality when he would need it “many years from then.” The way he described it made me think of seeing someone approaching a red light – we expect that the person will stop at that light -- we don’t give it a second thought ...unless it doesn’t happen that way.

As years went by, and he saw no signs of Cryonics being developed, he eventually had (what I call) an “oh crap!” moment. He realized that he would have to do it himself! This was not something that he particularly wanted or ever expected to do. He founded the Cryonics movement because no one else did. I think he did not view Cryonics as a “movement” but rather just as an obvious technological or medical step. To the end, I got the impression that it surprised him that he had had to take on the role that he did.

Not that you would know it from talking with him, but it was hard work, financially demanding, often tedious, and frequently laughed at. We must think about that as we go through our daily lives trusting others to do the work of making technological and health science successful and helpful. And we must take action. A true tribute to Robert Ettinger is for us to put in the effort, the hard work, that is needed.

In the early 1990’s, he had taken it upon himself to daily call one of our elderly members who had no close family or friends. Later I took over for a while. But it was Robert Ettinger that ensured that this man had someone checking on him. Because of Bob’s efforts, all of the staff in the man’s apartment building knew Bob, me and Andy Zawacki, and trusted us. Because of this, when the man died, alone in his bathtub at age 96, we were able to get him to CI within 24 hours despite the required police investigation and other potential delays.

While this man was alive, Bob also personally paid for a monthly cleaning service to help the man clean his apartment. When the man fired the cleaning service (because he trusted no one ... except Bob), Bob asked my wife and me if we would help clean the apartment. We were a young starving married couple and Bob paid us $10/hour – quite a sum at that time – out of his own pocket to clean. We did that monthly for two or three years, gaining the gentleman’s trust. In this way Bob helped the member who in his later years could not keep his apartment from becoming so dirty as to be a health hazard, helped us to put food on the table, introduced this lonely man to us and us to this interesting man. And he called the man daily to check on him for several years. The President of the Cryonics Institute, the Founder of Cryonics, the concerned gentleman who tried to help where he could.

In the late 1990’s, shortly after my wife and I married, we went to Arizona, where Bob and his second wife Mae – his first wife Elaine had died in the 1980s and was CI’s second patient – were living at the time to get away from the cold weather of Michigan. I had told Bob (by that time I had, with much discomfort, accepted multiple requests to call him by his first name) – that we were coming out and he invited us stay with Mae and him. Their home was welcoming and modest. Though we were staying with them for over a week, and were so appreciative of their hospitality, one of the first things that they did was to give US a gift! Since we had eloped we got very few wedding gifts (I can think of three, including the one from Mae and Bob) and did not expect one from this couple that we really did not know well at that time.

Mae had had a stroke not long before we went out there and was not the same woman as she had been. We went to dinner and Bob had to keep reminding her not to eat too fast. He was so patient with her, even when she...
forgot and ate too fast and choked, which happened several times at that dinner and, I would guess, often. And when she had her second stroke, he called 911 and comforted her before the paramedics arrived. How difficult it must have been for him. This woman who had been his peer and whom he now had to take care of. This woman who was his wife, then suffering with a stroke that would kill her and which at that time caused her arm to go up and down, up and down. He was patient and he gave as best he could to try to comfort her, keeping his own pain to himself, though we could see it in his eyes as he told us about it later. Bob did not laugh much or express other emotions often – to me anyway – but his eyes would.

Later, after Mae died and Bob moved back to Michigan, we had dinner with him on several occasions. The discussion was always stimulating. And Bob never minced words. If he disagreed with you his eyes would harden and you would get a passionate but reasoned response – quoting from multiple sources including science texts, philosophers, and even the Bible (his knowledge of which surprised me given his lack of religious belief). There were a few times that I thought he was angry with me. Fortunately I asked him – and he was surprised! His passion was distinct from his concern for others – or perhaps born out of that concern. I remember my surprise seeing this strong man tear up when he spoke of his brother who, at the last minute, decided not to be cryopreserved.

Bob’s patience did not extend to fools or the ignorant who wanted to remain ignorant. With those who would discuss things intelligently he would always be ready to talk. He would consider others’ positions and sometimes change his own. But he was unyielding when he had decided he was correct. As he one time said to me jokingly about himself, “often wrong but never in doubt.” And he was tenacious. It is said that God warned Noah and the people of Earth of the flood 120 years before it was to occur, and that during those 120 years after the warning Noah built his ark and spoke with all who would listen – while most would come and laugh.

He was a teacher. My Uncle was a student of Professor Ettinger’s at what is now Wayne State University in the 1950’s. To this day he remembers Robert Ettinger’s physics class. What does he remember about it? The times that he discussed cryonics. Ask my Uncle how many other topics of study he remembers from college.

In the last few years, we saw each other generally over the weekend of the annual meeting and very occasionally for dinner at a restaurant or at our home. It was not easy for Bob to get about, and we live about 45 minutes drive away. And life is busy.

I will miss his demeanor as well as his kindness and words of wisdom. Henry Kissinger described the lame duck President in part by saying, “days go by in which one carries out one’s duties as if one’s actions still matter.” Robert Ettinger epitomized the reverse of this. Several years ago he stepped down as President of CI. He remained available whenever we requested his advice or assistance, but otherwise pretty much – in his words – stayed out of the way. I think that his concern at that point was that, like a child that you have nurtured, there comes a time when an organization must stand on its own. For CI to grow and thrive – and survive - WE must take the baton and trek on on our own. That shows incredible humility and wisdom. Thank you Bob, I will miss you.

Several people reminded me that Bob has said – especially in recent years – “the wind is in our sails.” WE ARE THAT WIND. This last is a request to everyone here today, to those watching the recording and to myself. May we all put in for you Bob, half of the effort that you put in for us – to revive you and all of those now and future cryonauts. The memorial to Robert Ettinger is not here today. It is what we each do . . . tomorrow.
Hi All!

CI will be conducting our Second Silent Auction at the 2017 AGM, allowing attendees to bid on a number of items. All monies raised will be donated to the Cryonics Institute, so we’re hoping this will be a fun and rewarding addition to our Annual Meeting as well as a great way to raise donations.

The success of this project will depend in large part on the items received, so we’re actively looking for nice items for this auction. Interested individuals, companies or other sponsors who would like to participate by donating items or by helping to solicit donors can contact me by email at

stephan@cryonics.org

I’m also looking for positive volunteers who will be attending the AGM to help with the event.

Silent Auction Rules:

1. By bidding in the Cryonics Institute’s Silent Auction, each bidder agrees to these auction rules.

2. All sales are final. There will be no exchanges or refunds unless otherwise noted. All items are “as is.” CI has attempted to describe the items correctly, but neither warrants nor represents and in no event shall be responsible for the correctness of descriptions, genuineness, authorship, provenance or condition of the items. No statement made in this CI Online Magazine, or made orally at the auction or elsewhere, shall be deemed such a warranty, representation, or assumption of liability.

3. The auction item value listed is an estimate of fair market value. Items have not been appraised unless so noted. The amount you pay above this fair market value estimate is normally tax deductible as a charitable contribution. Please consult your tax adviser to clarify amount of deduction.

4. Payment for items purchased must be made in full on the day of the auction to Andy or Hillary. CI accepts cash, Master Card, Visa, or a check made payable to CI. Please allow 30 minutes after the silent auction bidding has closed before reporting to Andy or Hillary.

5. Following payments, you may pick up your purchases in the checkout area (CI facility office space). You must show your paid receipt for items to be picked up.

6. The purchaser must pick up all items the day of the auction (Following the 2017 AGM, Sunday, Sept. 10), unless special arrangements are made with CI. Any item left unclaimed, without prior arrangements, will be sold in the future and proceeds will go to CI.

7. CI reserves the right to add or withdraw items, without notice, to or from the auction.

8. Each person bidding assumes all risks and hazards related to the auction and items obtained at the auction. Each bidder agrees to hold harmless from any liability arising indirectly CI, their elected and appointed Officials, Employees and/or Volunteers connected with the auction.

Best Regards,

Stephan Beauregard
CI Director
Communications & Social Media
If you’re planning a vacation, you make reservations in advance to ensure there’s a room available when you reach your destination. If you’re buying a car or a home, you grudgingly accept there will be contracts to sign, paperwork to fill out and financial arrangements to deal with. You don’t just drive a car off the lot of a dealership or move into a house and assume “I’ll just deal with the contracts and financing and all those other boring details later.”

If you really want to take that vacation, own that new home or drive that new car, you take the time and effort to make all the necessary arrangements, sign all the required documents and get the financing in advance.

These are common sense things no one would realistically consider doing any other way.

Your “reservation” for cryopreservation with CI is no different. In order to “book a reservation” for indefinite cryonic storage a person needs to 1) Have a paid membership 2) Sign a suspension contract and 3) Have the necessary financial arrangements in place to pay the cryopreservation fee.

Unfortunately, we still run into situations where someone decides to be cryopreserved at the last minute (or have a recently deceased family member preserved) without having taken any of those required steps in advance. Of course, just like a regular medical emergency, time is of the utmost importance in a cryonics emergency.

What people often fail to understand is why CI or another cryonics organization can’t respond like a traditional 911 emergency service, instantly and decisively with just a phone call. Unfortunately, the close association in many peoples’ minds between traditional emergency services and a Cryonics Emergency invites a number of incorrect assumptions about the actual process. For one, you don’t have to sign contracts or make payments in advance when you call 911. Calling 911 means you receive medical attention as soon as possible, no questions asked. If there’s a problem with insurance, fees or other complications those don’t stop you from getting immediate medical care. Those details are sorted out and dealt with after the fact.

Emergency first - paperwork second.

Many people assume a cryonics emergency should work the same way - get the patient stabilized, transported, per-
fused and into cryonic storage as quickly as possible. In this, they are 100% correct, as that is exactly how to ensure an optimal suspension. The unfortunate difference is that unlike a 911 emergency, a cryonics emergency requires all those legal and financial arrangements to be made in advance - not afterwards.

Why is this the case? If our goal is to preserve people, shouldn’t we operate along the same lines as emergency services and put the patient’s needs ahead of everything else? Ideally, yes - we would love to have the resources to be able to instantly respond to cryonics emergencies anywhere in the world, stabilize the patients, get them into cryostasis and be able to worry about paperwork, contracts and payment after the fact.

This, however, is unfortunately not the case and there are three primary reasons why.

**LEGAL RAMIFICATIONS**

First and foremost, prospective cryonauts need to understand that cryonics is still considered an experimental procedure that is not widely accepted or even understood by the majority of the population. No one needs to tell an EMT or a doctor what to do when someone has a heart attack - the procedures, medications, training and equipment are all in place and understood universally. So there is no delay or question when the paramedic arrives as to what to do and where to take the patient. A cryonics patient on the other hand is a special case most of these people have never encountered before so many professionals will question if the required procedures are ethical or even legal. And their concerns are justified by law. Most countries have very specific laws regarding the handling and disposition of human remains, and those laws don’t include a blanket provision for cryonics. Cryonics is a special case, and therefore special arrangements need to be made in order to even begin the required procedures.

Think of the example of organ donors, which is legally very similar to a cryonics arrangement. An organ donation is a pre-determined and legally-binding agreement made by the individual that includes clear documentation stating their consent to be a posthumous donor. Now imagine a medical facility, funeral parlor or morgue simply collecting organs without any legal documentation or consent whatsoever. Asking CI to preserve a patient without a contract - without that patient’s legal consent – would amount to the same thing - illegally performing procedures on patients.

Another serious obstacle is the fact that our patients are deanimated and unable to speak for themselves, so it is literally impossible for CI to perform the procedure and ask for legally-binding consent later. This leads to other issues, since many people believe they have the legal right to “speak for” and make decisions for a deceased relative in regard to cryonics. In practice, this kind of authorization works fine with regard to a traditional disposition of remains, like choosing a funeral home or making other arrangements without the deceased’s specific prior consent.

However, in regard to organ donations, the basic rule of thumb is that any previously documented wishes of the deceased’s are always the first-level decision. If he or she had legally documented that they did NOT wish to be an organ donor, then no one can change that decision after the fact. In cases where the deceased has no formal record either in favor or against, the decision transfers to relatives or that person’s assigned executor or personal representative. What’s troubling is that without specific legal wishes recorded, there is really no clear-cut determination of which family member(s) can make a final decision, which can result in ugly and protracted legal battles. In many cases where family members are in disagreement as to an organ donation, medical professionals will simply opt not to accept any donation as the safest option.

Applying this logic to cryonics reveals an even more problematic situation. A cryonics patient is essentially a “Whole body organ donor” with specific instructions to be “donated” to CI intact after death. Consider the hypothetical case of a patient with no legal contract or stated wishes to be “donated” to CI. As we have seen with traditional organ donations, if the family cannot come to complete agreement, chances are very good the patient will not be suspended as the legally safest option. In fact, without specific legally authorized consent, CI cannot accept a patient at all.
In this hypothetical case, the best case scenario is the family quickly comes to complete agreement and can provide verifiable consent. However you still need to take the time to collect the paperwork, sign and notarize the documents and so on. In a worst-case scenario, you have long, drawn-out legal battles with family members arguing, suing and counter-suing one another while the prospective patient remains in limbo at a time when every second counts. Imagine this as a person suffering a heart attack who can't be treated until all the family members have been contacted and can agree in writing on a specific hospital, doctor, procedures and etc. If that were the case, the survival rate for heart attack victims would likely be a dismal zero percent.

Therefore, understandably, CI's policy is to absolutely require a signed legal consent contract from the patient (or their verifiable legal representative) and in advance of any cryostasis procedures. As you can guess, this isn't something that can be settled and verified in a 5-minute phone conversation. Once again - time is wasting while the patient isn't receiving the critical care they need. The most tragic thing is all this could be avoided by the patient simply taking the time before they pass away to sign CI's required Suspension Agreement contract, thereby legally documenting their intention to be cryopreserved.

Yes, it would be wonderful if we could simply take a new patient on verbal consent and fill out the legal documentation and arrange payment with the family later, but unfortunately this would be illegal and open us up to a world of serious consequences. To protect ourselves and our patients, we must refuse to perform any cryonics procedures on persons without a formal, legal contract in advance.

Please, if you are serious about being cryopreserved, make a commitment to fill out a contract as soon as you make the decision you want to be preserved. If you change your mind sometime in the future, you can nullify the contract without penalty. However, if you want to be preserved and don't sign a contract, you cannot go back in time after you pass and sign up.

CI's goal is not to lock people into contracts or force them to pay for procedures they eventually decide they don't want. Our goal is to make certain that our members who want to be cryopreserved and who have paid to be preserved are, in fact, successfully put into an optimal suspension. We cannot do that without your legal consent, so please do not wait to take this critical step and call CI today to make your contract arrangements.

You will be protecting your financial investment, your cryostasis and your potential to enjoy a new life in the future.

**FINANCIAL CONSIDERATIONS**

Obviously many people who attempt to schedule a last-minute suspension don't have $30K immediately available to pay the suspension fee and inevitably ask why they can't just "pay it later," or "pay in installments." Again, we are dealing with a time-sensitive emergency so they are often upset to discover a financial obstacle in the way of getting immediate help.

In emergency medicine, payments are considered after treatment and hospitals cannot turn you away or demand payment up front before they will treat you. For one thing, depending on the procedures, tests and other factors involved, no one can estimate the exact amount of the bill until all procedures and tests are completed anyway. Second, in most cases, the patient survives their trip to the ER and is thus around to settle their debts personally or through insurance. Third, many components of the emergency first-response system (911, fire and police) are publicly-funded and essentially cost “nothing” for the patient. Finally, the medical system is a gigantic economy that is better-equipped to absorb defaults or non-payments. In comparison, cryonics can only count on a relatively tiny number of patients and donations for funding and is far less able to absorb expenses without payment.

Cryonics is also unique in that all of our patients come to us deanimated and are therefore unable to “pay their bills” in full or in installments themselves. Without prepayment, the onus of payment would fall on either their estate or their surviving family members. This is where things become problematic in the extreme.
It's important to note here that CI is not, and cannot operate as a charity. Any cryonics organization absolutely must be financially solvent for the long-term because, unlike a hospital, or even a nursing home, we are responsible for maintaining patients indefinitely. CI cannot afford to simply "go out of business," because we have the lives of ourselves, our family and friends in our care.

A patient’s one-time suspension fee is expected to cover the necessary expenses to maintain that patient for a minimum of several years, even if no new revenue came in. More important, that money is invested in stable and safe growth portfolios so it can grow over time to cover those costs indefinitely. CI would certainly benefit from a higher suspension fee, but one of our primary goals is to keep the cost of suspensions affordable for the average person rather than trying to earn profits.

Which brings us back around to the last-minute suspension prospect asking to “pay later.” Much as we would like to help people and trust they will make good on their word, unfortunately, this is not always the case. In light of the unique position entrusted to us by our patients, we cannot take the risk of accepting unpaid patients into our care and the subsequent extra financial burden. There are many costs associated with accepting a new patient, and if the family were to renege on their agreement CI would be out several thousand dollars up front for transport, perfusion, and other preparation costs, not to mention the expense of maintaining the patient in liquid nitrogen indefinitely.

Sadly, this isn’t a hypothetical scenario. One of the earliest attempts at public cryonics was attempted by a man named Bob Nelson who started the Cryonics Society of California in the 1960’s. Nelson’s model was essentially a subscription which required the patient’s surviving relatives to make regular payments to cover the maintenance costs for their cryopreservation. Inevitably, many family members got tired of making payments on something they considered a fool-hardy waste of money. In some cases, the families simply had their relatives thawed and buried. In others, they simply stopped paying altogether and left Nelson in the unenviable position of having to cover the costs himself or lose the patients. Needless to say, this situation did not end well and has become a notorious legend in the world of cryonics.

On the positive side, this early failure and a handful of others like it informed and motivated the cryonics organizations of today to adopt the policies we have now concerning prepayment.

Additionally, payment for cryonics is typically covered by the patient taking out a life insurance policy with CI as the beneficiary. Rather than scrimping and saving and worrying you may not have enough money in your savings when the time comes for your preservation, a life insurance policy automatically activates and pays out at the exact time you need to pay for your suspension. For more information on life insurance funding, please visit http://www.cryonics.org/resources/life-insurance.

INFRASTRUCTURE

As our third point of comparison, take a moment to think about something we usually take for granted - the infrastructure required to handle a typical 911 emergency call.

First and foremost, in order to be effective, emergency services need to be close enough to people in an emergency situation to be able to reach them in time to help. The world’s most advanced hospital does few people any good in an emergency if it’s located on a remote island that takes a minimum of twelve hours to reach. Similarly, one hospital, one ambulance and one doctor cannot effectively service the entire world, so you need redundant resources spread out to serve multiple regions as well as a communications infrastructure to tie them all together.

In detail, there need to be dedicated call centers and staffs on duty to field and process emergency calls. Once a call is received, there has to be a system in place to process the call and dispatch the nearest first-response team to the scene. The first-responders dispatched to help need training, equipment, vehicles and buildings to operate from. After this team reaches the scene and stabilizes the patient, that patient is then rushed to the nearest hospital for more intensive care. A hospital requires massive resources including expensive, specialized equipment, buildings and skilled personnel.
Let’s consider hospitals as the central hub for medical care, with each hospital serving multiple emergency call centers and first-response (police, fire and ambulance) teams. According to the World Health Organization’s figures from Feb. 2017, there are 19,217 hospitals worldwide. If we make a ridiculously conservative estimate of just one call center and one EMT team for each hospital, the resources involved to provide emergency medical services worldwide adds up to a staggering 57,651 facilities, each with dedicated staff and equipment available 24-7-365.

Extending this analogy a bit further, if we estimate just 20 people on staff at each facility (call center, response team and hospital) we are looking at 1,153,020 employees on duty every hour of every day of every year. If we then pay those people (doctors and specialists included) a minimal $25,000 salary each, the annual budget for staff alone would be $23,060,400,000. Just imagine the cost for realistic staff and salaries, buildings, equipment, medications, upkeep and etc. and you can see the medical emergency infrastructure we enjoy today easily runs into the trillions of dollars.

Wouldn’t it be great if CI had trillions of dollars and could provide a similar fast-response apparatus that was on call 24-7-365 to respond to cryonics patient emergencies anywhere in the world within minutes? (And still only charge $28,000 for a suspension?!)

To some people looking for a last-minute suspension, this seems like a reasonable option to expect. “An ambulance can be at my home in 10 minutes. Don’t you have a professional, fully-equipped and trained standby team available within minutes as well?” In case you haven’t guessed already, much as we would prefer otherwise, CI doesn’t have trillions of dollars to set up and maintain call centers, mobile standby units and facilities around the world. Even a professional standby outfit like Suspended Animation Inc. that has a mobile standby unit ready for action would be hard-pressed to respond to a telephone call hundreds or even thousands of miles away in the same time that an ambulance can reach you in a 911 emergency without some kind of reasonable advanced notification.

Alternately, the last-minute cryonics prospect may have hopes they can call CI and we can walk them through the procedure on the phone. Without preparation, prior knowledge, and the right equipment, this is obviously an extremely challenging if not hopeless task. Add in the previous issues of no contract, no funding and no prior heads-up and you have just made your preservation a million times more difficult, or even impossible to achieve than you had to.

However, with advance warning, for example calling CI and/or SA to report a critical hospital condition patient who is going to need standby in the very immediate future, your odds of success increase dramatically. Extend that timeframe by a year, a month or even a week or two and your chances of being prepared are even better.

This is why we are so diligent about encouraging our members to prepare, prepare and prepare and our mantra is standby, standby, standby!!

We hope this article helped to give you a new perspective on the challenges we face as cryonicists, the reasoning behind our policies and, more important, encouraged you to take the relatively simple steps needed to overcome some of the most daunting challenges that can occur. The good news is that none of these issues need to be challenges or problems at all if we just do some basic pre-planning and due diligence prior to our preservation. Sign a contract, arrange for funding and notify CI immediately of any pending or even unexpected cryonics emergency.

We also hope that the majority of our members reading this are chuckling to themselves, and consider this all to be obvious common-sense information - your contracts are already signed, your funding is arranged and you have your standby arrangements in place. However, if you know someone who is considering cryonics, or might not be as proactive as you, we encourage you to share this article with them to help us all avoid “last-minute” catastrophes and to help educate fellow, or aspiring cryonicists on the differences between a 911 call and a cryonics emergency. It’s easy to confuse the two and make assumptions if you don’t have the facts, so the more we can do to educate people, the better.
5 worst mistakes in Cryonics

1) Not signing up ahead of time

Becoming a member, having contracts in place, and having paperwork in order should not be last-minute decision. Waiting last minute or after death results in a unnecessary delay of care or worse - No suspension at all!

2) Not providing proof of funding

Some people believe that they can worry about funding later or if they have funding they have put off providing funding proof to CI. This should be done annually. Failure to have proper proof of funding on record results in a delay of care while the funding clears. This can take weeks.

3) Not telling anyone your plans

Being reclusive, and not telling family or friends about your cryonics arrangements is not recommended. You should not be afraid to tell those around you what your wishes are, especially your next of kin. Wearing a cryonics bracelet, necklace or having identification or other items in view can speak to your wishes. This is all you have when you can’t speak for yourself. Disasters have resulted from these types of notification failures.

4) Not planning

Many think cryonics is a turnkey service where you can just sign up and let fate take over. No matter how much you pay for cryonics you are the only one who can make sure that you will have the best chance by planning and preparing in advance. CI has provided a lot of information on our website and in our standby manuals to help you with this process. Those who plan succeed - those who don’t fail.

5) Not notifying CI of Emergencies

There is no way that your cryonics provider can help you if they do not know about your emergency. Your family, friends, standby group or next of kin must immediately contact CI when you are having health issues or worse. Any delay in notifying us directly could result in a poor suspension. Those helping you must have simple and clear instructions, and contacting CI should be on the top of their list.
Who will be there for YOU?

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

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

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

Speak to a nurse today about how to sign up.

Call 1-949-482-2150

or email tabitha@suspendedanimationinc.com
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 jambarnett@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 cryonicists. Services available in French & English: stephan@cryonics.org

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

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

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

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
HELP US STAY UP-TO-DATE!

If you live in one of the countries listed, we'd appreciate if you would please take a moment to contact the groups listed in your country to confirm their details. Also, if you know of, or are considering starting a support, standby or other cryonics-related group in your area, please send details to cryonicsnews@gmail.com.

JOIN A CRYONICS GROUP!

The Cryonics Institute encourages members to join, or form, local cryonics standby, support and social groups. If you’re interested in joining or forming a group of your own, please check upcoming issues of the CI Newsletter to learn more about CI's new Cryonics Groups program.
Heart tissue cryogenics breakthrough gives hope for transplant patients

Successful freezing and rewarming of tissue sections by US team avoids damage by infusing them with magnetic nanoparticles, paving way for entire organ

Scientists have succeeded in cryogenically freezing and rewarming sections of heart tissue for the first time, in an advance that could pave the way for organs to be stored for months or years.

If the technique scales up to work for entire organs – and scientists predict it will – it could save the lives of thousands who die each year waiting for transplants.

The work is being hailed as a major development in the field of cryopreservation as it marks the first time that scientists have been able to rapidly rewarm large tissue samples without them shattering, cracking or turning to a pulp. The US team overcame this challenge by infusing the tissue with magnetic nanoparticles, which could be excited in a magnetic field, generating a rapid and uniform burst of heat.

READ THE FULL STORY AT THEGUARDIAN.COM

Groundbreaking technology rewarms large-scale animal tissues preserved at low temperatures

A major step toward long-term preservation of organs and tissues for transplantation; could lead to saving millions of human lives

A research team led by the University of Minnesota has discovered a way to rewarm large-scale animal heart valves and blood vessels preserved at very low (cryogenic) temperatures without damaging the tissue. The discovery could one day lead to saving millions of human lives by creating cryogenic tissue and organ banks of organs and tissues for transplantation.

The research was published March 1 in an open-access paper in Science Translational Medicine.

Long-term preservation methods like vitrification cool biological samples to an ice-free glassy state, using very low temperatures between -160 and -196 degrees Celsius, but tissues larger than 1 milliliter (0.03 fluid ounce) often suffer major damage during the rewarming process, making them unusable for tissues.

READ THE FULL STORY AT KURZWEILAI.NET

Programmable shape-shifting molecular robots respond to DNA signals

Could function like living organisms in the near future, programmed by DNA computers

Japanese researchers have developed an amoeba-like shape-changing molecular robot — assembled from biomolecules such as DNA, proteins, and lipids — that could act as a programmable and controllable robot for treating live culturing cells or monitoring environmental pollution, for example.

This the first time a molecular robotic system can recognize signals and control its shape-changing function, and their molecular robots could in the near future function in a way similar to living organisms, according to the researchers.

READ THE FULL STORY AT KURZWEILAI.NET
New machine-learning algorithms may revolutionize drug discovery — and our understanding of life

A new set of machine-learning algorithms developed by researchers at the University of Toronto Scarborough can generate 3D structures of nanoscale protein molecules that could not be achieved in the past. The algorithms may revolutionize the development of new drug therapies for a range of diseases and may even lead to better understand how life works at the atomic level, the researchers say.

Drugs work by binding to a specific protein molecule and changing the protein’s 3D shape, which alters the way the drug works once inside the body. The ideal drug is designed in a shape that will only bind to a specific protein or group of proteins that are involved in a disease, while eliminating side effects that occur when drugs bind to other proteins in the body.

READ THE FULL STORY AT KURZWEILAI.NET

First stable semisynthetic organism created

Scientists hope to “impert life with new forms and functions”

Scientists at The Scripps Research Institute (TSRI) have developed the first stable semisynthetic organism — a bacterium with two new synthetic bases (called X and Y) added to the four natural bases (A, T, C, and G) that every living organism possesses. Adding two more letters to expand the genetic alphabet can be used to make novel proteins for new therapeutics, according to the researchers.

All life as we currently know it contains just four bases that pair up to form two “base pairs” — the rungs of the DNA ladder — which are simply rearranged to create different organisms.

READ THE FULL STORY AT KURZWEILAI.NET

Scientists create first 3-D synchronized-beating heart tissue

York University scientists have created the first in vitro (lab) 3D heart tissue made from three different types of cardiac cells that beat in synchronized harmony. It may lead to better understanding of cardiac health and improved treatments.

The researchers constructed the heart tissue from three free-beating rat cell types: contractile cardiac muscle cells, connective tissue cells, and vascular cells. No external scaffold was used and the cells were the only building blocks of the generated cardiac tissue. The researchers believe this is the first 3D in vitro cardiac tissue with three cell types that can beat together as one entity, rather than at different intervals, with high cell density and efficient cell contacts, and without the requirement of external electrical stimulation.

READ THE FULL STORY AT KURZWEILAI.NET

A 3D bioprinter that prints fully functional human skin

A prototype 3D bioprinter that can create totally functional human skin has been developed by scientists from Universidad Carlos III de Madrid (UC3M) and BioDan Group in Spain. The skin has been used to treat burns as well as traumatic and surgical wounds in a large number of patients in Spain, according to the scientists.

The system provides two processes.

Autologous skin (from the patient's own cells to generate human collagen) for therapeutic use, such as in the treatment of severe burns, instead of the animal collagen used in other methods. The researchers have applied for approval by various European regulatory agencies to guarantee that the skin that is produced is adequate for use in transplants on burn patients and on those with other skin problems.

READ THE FULL STORY AT KURZWEILAI.NET
MEMBERSHIP BENEFITS

Why join the Cryonics Institute?

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

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

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

4) Lower Prices for Spouses and Children
The cost of a Lifetime Membership for a spouse of a Lifetime Member is half-price and minor children of a Lifetime Member receive membership free of charge.

5) Quality of Treatment
CI employed a Ph.D level cryobiologist to develop CI-VM-1, CI’s vitrification mixture which can help prevent crystalline formation at cryogenic temperatures.

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

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

8) Cutting-Edge Cryonics Information
Members have access to both the Cryonics Institute Newsletter and Long Life Magazine online, as well as our Facebook page, an official members-only forum (coming soon) and more.

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

10) Support Education and Research
Membership fees help CI to fund important cryonics research and public outreach, education and information programs to advance the science of cryonics.

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

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

To get started, contact us at:
(586) 791-5961 • email: cihq@aol.com
Visit us online at www.cryonics.org
Member Readiness Checklist
You’ve signed up for cryonics - what are the next steps?

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 than 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 you 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.

☐ Keep up to date! Read CI Magazine and follow the simple “STANDBY WORKBOOK” exercise in each issue.
Letters Welcome
One of our goals for the CI Newsletter is to provide a forum for member outreach and opinion in addition to the existing online forums. If you have comments to share, feel free to write us at cryonicsnews@gmail.com. We may introduce a letters column if response is favorable, so if you do write, please indicate if your letter is approved for publication or not.

CI Standby Kits
CI offers pre-made Standby Kits complete with all required equipment and detailed instructions. These kits are perfect for an individual or a group planning local standby support. Basic and Intermediate kits are available for sale now. To purchase a kit, please contact us at: cihq@aol.com

Call for Volunteers
CI is always looking for volunteers to help with our many projects and initiatives. If you have skills in design, programming, writing, marketing, public relations, science or simply have enthusiasm and energy to contribute, you can make a difference at the Cryonics Institute!

Writers Wanted
Got something to say? The CI Newsletter is looking for submissions from our readers! If you’ve got a great idea for a story, please forward it to: cryonicsnews@gmail.com

Show the world you support cryonics with CI gear from our Cafe Press store.
R.C.W. ETTINGER

MAN INTO SUPERMAN

After immortality......comes transhumanity. And OUR generation can be part of it.

Robert C.W. Ettinger’s

“Man into Superman” Part 8

29 CRYONICS INSTITUTE MAGAZINE • CRYONICS.ORG
It's no disgrace to be poor, but
it's no great honor, either.
-Tevye, Fiddler on the Roof

When the trumpet of medical science calls us frozen patients back to active life, we shall see great and splendid things—almost as great and splendid as the Christians among us expect after Gabriel’s Last Trump. Yet there is a psychological problem, a certain ambivalence of potential immortals toward that world of the awakening. If it is pictured too much like the present, it isn’t very attractive: “Once around is enough.” If it is imagined too different from the present, that’s bad too; we are weakened by hesitation, trepidation, and a sense of unreality. Hence we must build half-way houses in our imaginations—not simple-minded utopias, but down-to-earth visions of a near future in which “superhuman” will still have the accent on the human.

Predictions of the near future are in many ways the most difficult. Again, there is no attempt to be comprehensive or even completely consistent; these “predictions” are intended mostly as casual—although not irresponsible—looks at some of the possible avenues of change and new conditions of life. Most of these avenues require solid gold pavement, and the new conditions can exist only atop enormous mountains of money. Every Man a Billionaire In Al Capp’s comic strip, Li’l Abner, one of the more engaging institutions is the Billionaire’s Club, which has a sign in front to warn the riff-raff: Millionaires, Keep Out. Well within the next century or two, if exponential growth continues, that sign will be discarded, and the club disbanded, because not even in the most dismal pockets of poverty—not even in Dogpatch—will there remain any such pitifully disadvantaged wretch as a millionaire. One reason for determining to extend our lives, then, is clear: we simply can’t afford not to stick around.

At least, this would have seemed a reasonable expectation to almost everyone just a few years ago, since it embodies the traditional American outlook: bigger and better, faster and cheaper, onward and upward forever, excelsior! Many of us still have this outlook, but at the moment optimists have to be a little defensive. At any rate, we will concede that the possibility of unbounded economic progress is not self-evident.

The historical sources of increasing wealth are three. The first is the use of surplus wealth to create more capital goods; the growth of capital from savings is compound interest. The second is the discovery of better methods in economic tasks and the invention of labor-saving machinery, which we can typify as the use of robots. The third is the discovery of new bounty in nature, e.g., virgin lands or outcroppings of native metal or a medicinally useful plant. Can we depend on these in the indefinite future? Do they have limitations? Can wealth increase without limit?

Even the sober limits posed by serious students for the near future offer considerable scope. Herman Kahn and Anthony Wiener estimate that for the Year 2,000—a scant three decades hence, when most people now living will still be within their “natural” lifespans—the Gross National Product per capita in the U.S. will be $10,160 (in 1964 dollars), compared with $3,557 in 1965. (87) They guess that the typical member of the “Postindustrial Society” might work 4 days per week, 39 weeks per year, with 13 weeks vacation per year in addition to 10 legal holidays. And this is only the beginning.

Of course, extrapolations can be dubious. We recall the statistician who noted that American girls were marrying ever younger, the average age declining
by a year every four years, and who predicted that by 1999 the typical bride would be eleven years old. The economic growth curve will doubtless have some queasy squiggles in it, and maybe even dips, but material goods should, in the long run, increase without bound. Such wealth depends, after all, only on matter, energy, and organization.

Matter, including soil to walk upon, is in virtually inexhaustible supply even without leaving the Solar System; when necessary and desirable, we can anticipate manufacture of earth-like environments out of the other planets and planetoids, and perhaps one day out of the stars.

Energy is no problem either: there is a vast store of fission (atomic) energy in the granite hills, and a still vaster supply of fusion energy in sea water, when we learn to extract it; beyond that, again, the stars can fuel us. And organization should fairly soon reach its climax in the form of self-reproducing, self-improving, thinking and actuating machines capable of turning out almost anything desired in jig time and in any required amounts. We expect not to find our djinni in a bottle, but to design and build him ourselves, and thereafter to let him continuously redesign and rebuild himself. The humblest citizen then (if any remain humble) would have wealth to glut a million sultans.

Such optimism may seem glib and airy, although to me it reflects the clear trend of history. This is not the place to defend it in detail, but it does seem prudent briefly to answer the doom-criers, especially the sectarian ecologists and conservationists.

Rapid growth in industry and population has brought serious problems, including depletion of certain resources, loss of some natural beauty, and the release of poisons into air and water. At the same time, changing habits and weakening institutions have undermined the personalities and confidence of many. But the backlash almost threatens to outdo the frontlash at the moment, with the ecology freaks (as they sometimes call themselves) and the wild-eyed conservationists often substituting evangelical zeal for rational inquiry and useful programs. They tend to regard every problem as a doomsday crisis, and every loss as irreversible; furthermore, some of them equate material gain with spiritual loss.

In April of 1970 I was scheduled to lead off a “teach-in” at Highland Park College as part of the national Earth Day rites. At our school the program was cancelled because of the annual spring riots, but I learned a good deal about the radical ecologists, one of whom suggested we might meet the following disasters before 1980: (1) the death of all the fish in the ocean; (2) the collapse of agriculture in the under-developed countries; (3) the near-extinction of bird life; (4) smog suddenly killing 200,000 Americans; (5) a permanent drought producing a desert in the midwest; (6) the reduction of American life-expectancy to forty nine years or less—all from pollution or disturbed ecology.

I am convinced such threats are grossly exaggerated, and that almost all the trends decried by the eco-faddists are very much slower than alleged, or reversible, or both. After all, the eruption of Krakatoa caused more pollution in one day than world industry does in a year, and so probably do routine natural disasters such as forest fires. Lake Erie, loudly mourned as “dead,” still has as many fish as ever, although it will cost a lot of money to restore the balance of species we desire.

Even where the eco-freaks regard their arguments as indisputable, they are not. “Extinct” species of wildlife, for example, are not lost forever; leading biologists expect that one day it will become possible to grow new animals from scraps of fossil tissue. Talk of “spaceship Earth,” with its hints of an eventual “steady state economy,” is full of loopholes; many experts believe it will become feasible to expand beyond the earth, as well as into it.

The flavor of thought of some eco-crusaders can be sampled in these fragments from The Environmental Handbook. “Americans might be happier with fewer automobiles.” “(We) had better learn how to live the Simpler Life.” “The ‘massive American housing shortage’ is a myth.” “Less emphasis
on acquisition and material wealth as any measure of anything good.” “Let man heal the hurt places, and revere whatever is still miraculously pristine.” “Instead of being anthropocentric you have to care equally about all earth creatures.”

The emphasis was mine in the last quotation, although its absurdity scarcely needs emphasis. Fishes and flowers are fine, but whoever equates their welfare with that of people is a little confused; and a back-to-nature philosophy would simply bypass most of our present problems and altogether close out our future possibilities.

If someone chooses to live in the “natural” forest—or in the equally natural malaria swamp or alkali desert--it’s a free country. But let him not pretend that this will feed the underprivileged, or educate them; and especially let him not imagine that anything other than an intensive industrial-technological civilization can provide modern medical care. Unless he is rich to begin with, his bucolic idyll will come to an abrupt end with the first serious illness in the family--unless he succeeds in throwing himself on the mercy of the welfare institutions of the city folk. And for the longer term, the outlook is even clearer: the immensely improved and complex medical technology needed to provide extended life demands great wealth, hence can only arise from an industrial base and habits of work and competition.

It is needless (I hope) to say that I am not defending every aspect of modern life; among other things, the motor-boats that stink up our lakes disgust me. No more than anyone else is the cryonicist in favor of more smog or planetary paving; no less than anyone else do we enjoy quiet and open places. But one of our mottoes is “first things first.” We do not delude ourselves. Immortality costs money: to make it as individuals, we must earn and save substantial amounts; to make it as a society, we must increase the GNP, and rapidly. The notion that we can enjoy the fruits of labor without first laboring is a pollution of the mind, and it is this pollution which is the greater threat.

Enough, for the moment, of the fretful present; let us take out our trusty rose-colored glasses, and look at a few facets of the relatively near future.

A Measure of Justice

There is a striking relationship between “mere” wealth and gadgetry, on the one hand, and on the other, one of humanity’s loftiest ideals--that of justice under law. Regrettfully restricting attention to just two aspects of guilt and punishment, I shall demonstrate the possibility of enormous improvement in our current barbaric customs--improvements which, as far as I know, have not been proposed by others.

For a period, crime will remain a problem, and we must end the disgraceful prevalence of crime without punishment, and punishment without crime. A giant step in this direction will be the elimination of the guilty-innocent dichotomy, substituting instead a finding of probability or percentage of guilt.

In our present criminal practice there is a presumption of innocence, with conviction requiring proof “beyond a reasonable doubt.” In civil cases, on the other hand, the finding is based on a “preponderance of evidence.” The arithmetic in both cases is very grim indeed.

In criminal cases, let us assume that the probabilities of guilt of a suspect run smoothly between 50% and 100%. Let us also assume (grim laughter) that the judges and juries assay the evidence scientifically, and return convictions whenever the probability of guilt is greater than 95%. We then have the following situation: 10% of the suspects are convicted. 90% of the suspects are acquitted or dismissed. 75% of the suspects are (in fact) guilty. 12.5% of those released are guilty. 83% of the guilty are released. 2.5% of those convicted are innocent.

In civil cases, on the other hand, if the “preponderance of evidence” rule is interpreted to mean that a judgment is returned on a 75% probability, and if we assume, in those cases tried, a smooth distribution of probabilities from 50% to 100% in favor of the plaintiff, then we have:

75% of those complaining have cause.
75% of those defending are in the wrong.
50% of those complaining receive judge-
ments.
50% of those defending have to pay.
87.5% of those receiving judgements have
cause.
62.5% of losing plaintiffs were in the right.
25% of justified complaints cannot get into
court.
12.5% of the judgements are unjust.
62.5% of absolved defendants should have
paid.

Perhaps the most shocking injustice and danger
here is that, in the criminal cases, 83% of the guilty
are necessarily acquitted, and even so 1 out of 40
convicts is innocent.

Remember, also, that this is the ideal situation, assum-
ing probabilities accurately calculated, whereas in fact our antiquated, sloppy system mangles
the probabilities and makes the real situation much
worse than this. We often say, with naive pride,
that we would rather free one hundred guilty than
jail one innocent man; but with this set-up, even
idealized, out of every thousand accused we free
over six hundred who are guilty and we jail two or
three who are innocent.

Notice that there is no way out in the framework
of the existing system. Even if we rationalize our
procedures of evidence evaluation, even if we
educate our juries and give them explicit instruc-
tions on the calculation of probabilities, even if we
avail ourselves of the best computer services, we
shall still reach the above situation as a ceiling or
optimum; it is the best we can do on the basis of
guilty-innocent, as long as there are doubtful cases.
If we raise the required probability, say from 95%
to 98%, this will cut down the number of innocent
men convicted, but will increase still further the
number of the guilty who are acquitted. If we re-
duce the level from 95% to 90%, we shall convict
more of the guilty, but also many more of the in-
nocent.

In the civil cases, the picture is in some respects
even worse: counting those cases which do not get
into court, one-eighth of penalized defendants are
wrongfully punished and more than two-thirds of
the legitimate grievances are not redressed. Is this
not intolerable?

The remedy, as intimated, is to eliminate the di-
chotomies and make the disposition of the case
reflect the probabilities. For example, an accused
found to have a 50% probability of guilt in a rob-
bery case should not be jailed--but neither should
he go scot-free, since there is a substantial chance
that he is a danger to society. Instead, he might be
put under close probation, of a kind not yet eco-
nomically feasible, e.g., required to carry an elec-
tronic signal allowing his location to be monitored
at all times. If the probability of guilt is 75%, he
might in addition be required to make restitution
of part of the stolen money. There would also be
indemnities--payable by the state to the convict, if
it later could be shown that the penalty was unjust
or excessive.

The exact determination of the appropriate levels
and penalties will occupy large numbers of soci-
ologists continuously for a long time and will cost
a great deal of money, but it seems almost self-ev-
dent to me that, if we are to become civilized, this
is the direction we must take. In what we now call
civil cases, or generally in money disputes between
private parties, similar reasoning would apply: if
there is only a modest "preponderance of evi-
dence," then the amount of the judgement would
be correspondingly reduced. Even if the defendant
is more likely right than wrong, he might be re-
quired to pay something, e.g., if his probability or
degree of error is 40%, he might pay somewhere
between 20% and 40% of the maximum judgment.
This would improve the over-all picture, reduce
the likelihood of severe miscarriages of justice, and
make everyone more circumspect. Possible abus-
es--nuisance suits, etc.--could be minimized in
various ways, and there would doubtless be a cut-
off point; perhaps the minimum accountability
might be at the 25% level. The troubles created by
the new approach should be of a better class than
those eliminated.

Our second point concerns reforms in punish-
ment, which should fit not only the crime but the
entire situation, including the families involved.
Some of the vast improvements foreseeable are
available right now.

Suppose a crime, or a criminal, is so vicious or else
so uncontrollable that even close supervision (with radio tracking) is not deemed sufficient protection for society: is there then any alternative to prison? Several possibilities suggest themselves. A confirmed, stubborn pickpocket might have a finger or two surgically paralyzed; a rapist might be given female hormones. These alternatives might be made optional with the convict himself to eliminate any accusation of cruelty; my guess is that many would prefer such a solution, and would benefit from it. If the procedure, besides being optional with the offender, were also reversible, there could scarcely be any objection.

(It is not asserted that such solutions would invariably work; we realize that the pickpocket might turn to another, equally offensive trade, and the rapist's personality might still seek cruel expressions, but these avenues should not be closed.)

Another possibility, once suspended animation is perfected, would be to use anabiotic preservation in the case of the most serious crimes and the most conclusive evidence. The convict could simply be stored until a later age when a wiser court, with more resources, could review the case. This would be cheaper than prison, and would offer society complete protection, while still leaving the offender the potentiality of a full and normal life some day.

A Public Trough for Every Hog

The vastly greater complexity of the machinery of justice, intimated above, provides also a clue to another important aspect of everyday life--the nature of our daily work. I think that in the interim period we are considering--when wealth and technology are enormously improved, but we are still essentially human--that most people, most of the time, will do work related to government or politics. When automation becomes highly developed, very few people will be required for ordinary tasks of production and maintenance--what is now the chief economic business of the world--and all ordinary merchandise can be extremely cheap. Automobiles or their equivalents could be free in the same sense that drinking water is free today. Just as today you would give the most casual guest a drink of water, next century you may just as easily give him a Chevicopter if he needs one--and never think of expecting it back; municipal supply would routinely keep your garages full, presenting a small quarterly bill.

We could likewise expect food to be free, in ordinary quantity and variety, as well as clothing (if we wear any), furniture (if we continue to make it, rather than grow it), and most other kinds of "merchandise." . . . But now the confusion that exists in some minds about who will pay for all this must be cleared up: how everybody can be rich without doing honest work.

The kind of system hinted at here does not require revolution or communism; far from being un-American, it already exists in the United States today, and need only be carried to its logical conclusion. It is a system in which a small fraction of the people are responsible for the production, but almost everyone shares its fruits.

Consider the barber, who a few years ago in Spain, I was told, would cut your hair for five cents, or fifteen cents if he came to your house. In Detroit today the barber gets three dollars plus a tip, and the difference is unearned. The American barber produces not a whit more than the Spanish Barber--but he demands, and receives, his share of our generally higher production, which is almost entirely due to our businessmen and engineers. And any good union man will tell you that you do not work for money: you vote for it and you strike for it. (Little sarcasm intended; within reason, this is just as it should be.) Our capitalist state has gone a long way toward realization of the communist ideal--from each according to his ability, to each according to his need.

In a very real and important sense, then, the barber (like most of us) is living on a kind of public dole to the extent of at least 90% of his income. Put more tactfully and fairly, we implicitly recognize a basic dividend to which citizens are entitled, merely for breathing. This will probably be formalized before long, possibly under the name of negative income tax, which has been much discussed. When automation makes most types of work superfluous, perhaps only big businesses and unusually wealthy people will pay positive income taxes, the average
citizen living (luxuriously) on his negative income tax, supplemented by investments and the occasional sale of artistic work or personal services. But our souls may still yearn for work, and work there will be.

That we require work for our mental health is reasonably clear. Freud seemed to think so: “Laying stress upon the importance of work has a greater effect than any other technique of living in the direction of binding the individual more closely to reality.” (51) Keynes also: “If the economic problem is solved, mankind will be deprived of its traditional purpose ... I think with dread of the readjustment of the habits and instincts of the ordinary man, bred into him for countless generations, which he may be asked to discard within a few decades.” (91) There are some counter-examples and arguments, but perhaps most would agree that we need at least some serious, challenging, goal-directed activity if we are to avoid alienation, disorientation, and a generally sick spirit. This activity could be primarily bureaucratic and political.

Problems of legislation, administration, and adjudication are growing ever faster, and are unlikely to be met soon by technology alone. We can expect heavily increasing demands for service on juries, drain commissions, election boards, regulatory agencies, boards of arbitration, social service administrations, watch-dog committees, advisory panels, municipal councils, civic welfare agencies, lobbying associations, special interest caucuses, and so on. In these activities, the common man can make two vital contributions.

First, his run-of-the-mill skills can fill the gap, probably long extended in time, when there is a great deal of work too ill-structured for robots, yet well below the level of human expertise. Second, his native suspicion and conservatism, his well-founded distrust of the technocrats and professional politicians, will be desperately needed. He himself, John Doe, must review new policies; he, in person, must verify the books and bank accounts to keep the thievery in check; he must snoop the laboratories to verify what the scientists are up to. He must, in short, be the final custodian of the custodians.

This is a big order, but not impossible. To understand the broader features of policy, to review budgets, to verify accounts--these things require some intelligence and training, but as long as the experts are available as consultants, a professional level is not needed. To ferret out wrongs and peculations and perils--this demands mainly persistence and determination and a nose sensitive to rotten smells. To maintain structure, morale, and vigor in political parties--this needs primarily a sense of community and an instinct for survival.

The ordinary, no-talent citizen, then (in the pre-superman period), is likely to be a government employee or amateur politician. The work may not be arduous, but for the conscientious it will always be challenging, continuing education being a must. And far from being a parasite on the big brains, the little man can continue to be the bastion of freedom, holding tyranny and anarchy at bay ... at the same time enjoying a grand life, some aspects of which are speculated on below. Tissue Farming Foods & Fabrics

There has been much talk in recent years about farming the seas to feed our growing populations, and in particular about growing algae which can be processed for food. One hears of algae disguised as steak, hamburger, and other foods. Maybe so; but it seems more likely that tissue culture will largely replace animal husbandry, and perhaps much of plant farming as well. Instead of growing cattle, we will be able to grow steaks. Limited success in tissue and organ culture dates back several decades. Nearly everyone has heard of Carrel’s chicken-heart culture, which grew chicken-heart meat for many years and had to be constantly trimmed. Fairly soon, we ought to know enough about control of development so that any part of an organism can be nurtured separately.

For meat culture there are at least two obvious advantages, economy and humaneness, and at least one less obvious, versatility. It is wasteful to grow a whole steer when just a few select parts are preferred, and when the steer’s activity while growing is sheer loss of food energy. It is also inhumane and undermines our morale to treat other mammals so brutally, imposing a life of slavery ending in slaughter. At present, tissue culture is enormously
more expensive than ordinary farmer’s methods, but eventually growth of chicken muscles invitro may be a bigger step forward in economy than the use of batteries over barnyard flocks. (The raising of poultry in “batteries,” or ranks of tiny cages with automatically regulated feeding etc., was responsible for dramatically reduced prices; chicken, formerly a luxury, is now one of the cheapest of meats and poultry.)

Along with economy, the new versatility promises to be equally remarkable. Instead of having to breed a new variety of cattle to gain different or better meat or hides, one could merely adjust hormone and nutrition balances in the culture tanks to produce meat finer-grained or coarser, fatter or leaner, red or white; choice would be quick and cheap. Hides for leather could be designed thick or thin, stiff or supple, porous or impermeable, and of course with a full range of color options. And all this would be only merchandise, with no conscious entities born or dying: just grow a few more pounds of sirloin, slice it off, and package it.

Even more impressive savings might result from applying culture methods to such luxury items as mink pelts. To raise a mink for its skin is very roundabout and wasteful, minks being carnivores that demand expensive food. Growing the skins only, in culture, would allow furs of much greater variety as well as much lower price; we could develop every imaginable type and combination of hair and hide, for furs ranging from gossamer types fit for underdrawers to rainbow-hued and patterned sables and ermines. In fact, the individual customer, at no extra charge, can have his fur custom-made, his requirements being fed into the culture-computer which will set the growth parameters accordingly.

With plants the likelihood is not so clear, since the opportunities for economy are not so great; but even here, the versatility of tissue culture is so great that this may be the deciding factor. Being bound by the fixed heredity and development of a few standard plants is unsatisfactory, and we will probably insist on a system that permits the greatest flexibility in control and experimentation.

Genetic engineering’s most sensational impact will concern the modification of humans; but it will have other uses as well. Some of the “robots” that will serve us will need to be nanominiaturized or picominiaturized and this can perhaps be accomplished better organically than electronically.

If we can design sufficiently complex behavior patterns into microscopically small organisms, there are obvious and endless possibilities, some of the most important in the medical area. Perhaps we can carry guardian and scavenger organisms in the blood, superior to the leukocytes and other agents of our human heritage, that will efficiently hunt down and clean out a wide variety of hostile or damaging invaders. Possibly they can even be programmed to remove the scale from blood vessels and the fat deposits from those who tend to obesity. This remains to be seen. But it is known that very complex responses can be carried in beasties the size of small insects; hence the arthropoda may constitute the cheap labor of the future.

Consider the sweeping-scrubbing-dusting-waxing aspects of housekeeping. Possibly these could be delegated to an appropriately designed species of small bee. The bees would enjoy the work, just as they presumably enjoy nectar-gathering today. They would be less nuisance than machinery (provided bees don’t bug you) for several reasons: they would require no supervision, would be subject to no breakdowns, and would be less obtrusive, patiently waiting for you to move your feet before attending to that spot.

The bees do not have to understand the work, of course; they only have to feel a desire to do it. Existing bees feel an urge to gather and store nectar; certain ants and termites feel the urge to gather grains of sand for their mounds. Our tidy bees would be content to seek out grains of dirt, in a certain range of size and composition, and remove them to the disposal place. They need not work in a particularly orderly way, any more than modern bees in clover; but they would keep coming back, and scouring the territory until it became clean. Appropriate signals—whether odors or colors or radiations or what-not—could delimit the territory. Landing to rest could be permitted only in
the hive, and there could always be a shift on duty; breeding would be regulated by an instinct to keep the hive at optimum population. Economically, the savings would be impressive. (Yes, we billionaires probably will still be concerned with efficiency and thrift; didn't Lyndon Johnson keep turning out the lights?) Bees are self-repairing and self-reproducing. (Our machines will be too, but they are likely for a long time to remain great, clumsy things, with voracious appetites for rare metals and energy.) Bees demand only simple, cheap fare. The beautiful aspect of the symbiosis is this: we can gather or make food more efficiently than bees, but bees can gather small particles of dirt more efficiently than we, or even machinery.

Let us look at some numbers. What happens when a housewife vacuums 300 square feet of carpeting? It may consume a half-hour of her time, and between the pulling and pushing, shifting furniture, etc., 50 (kilo) calories of her food energy; worst of all, it probably bores her. The vacuum cleaner itself may consume 0.2 kilowatt hour of electrical energy; depreciates perhaps 3 cents worth, and tends to wear out the carpeting with all that dragging. If the vacuum cleaner becomes fully automated, then the housewife is saved effort and trouble, but the machine becomes even more expensive to buy, operate and repair, is bulkier to store, and more subject to breakdown; it may also impose stringent requirements on the design of the house, if it is to operate automatically, as long as robots are relatively stupid and cumbersome. And all this expenditure-- the cost of the machine, the electrical energy, the repairs, the housewife's effort, the wear on the carpet--all this is merely to move perhaps an ounce of dirt from the carpet to the trash bin.

Tidy-bees will do better and cheaper work. The carpet will always be clean, not just periodically. A hive of bees can gather several pounds of nectar in a day, ranging up to a mile or more. Thus, if your estate includes clover or other flowers and perennial blooms--and whose will not?--then the bees can gather their own food, and do the cleaning chores in addition, just by making the colony a little larger than otherwise would be self-sustaining. (However, your staff of multi-purpose bees may be too large to be self-supporting in this respect, with added chores mentioned below.) Admittedly, there are other solutions to the housekeeping problem of dirt. The building could be hermetically sealed, dust not permitted to enter; and already moderately successful dirt-repellent fabrics have been developed. But these are probably incomplete answers; we may prefer open windows and a more natural mode of life. Who wants to be a stranger to the outdoors? Who wants to live in a submarine?

The tidy-bees could keep the outdoors clean too, acting as gardeners, scavengers and vermin-hunters. They could cut and remove weeds, carry off certain kinds of debris and rout unwanted rodents and pestiferous bugs. In these chores they could, of course, be aided by genetically-engineered species of other classes and even phyla. Birds could be built whose principal pleasure in life is hunting mosquitoes and house-flies. This recourse would have many advantages over the increasing and increasingly dangerous use of poisons.

Certain possible difficulties suggest themselves, naturally. They are not ecological: our pest-killing birds will not depend on the pests for food, but only for sport or work, hence we need not tolerate any substantial pest population; there can be a very large ratio of predators to prey. But if the vermin-killing instinct is strong, and there are few vermin, will the birds become neurotic? Can they be psychologically stable? There are many affirmative answers to this; I leave it to the reader to supply some of his own. Finally, let us note that the indoor tidy-bee could even be given chores of personal hygiene. Why should we not have sharp mandibles, a gentle touch, and shave you while you sleep? Trim your toenails? Remove your dandruff? His soporific buzzing will be better than a sleeping pill, and he will enjoy the chores you detest. To bee or not to bee; there is no question at all.

The Sporting Life

To convey adequate appreciation of our future lives seems, in most areas, nearly hopeless, because the changes beyond the very near future will be profound, awesome and bewilderingly complex. But if we look at sports, perhaps we can get some notion of the color, variety and sheer fun in store for us.
In particular, let us toy with some of the implications of reduced weight, as found for example on the moon or (apparently) in the oceans.

Near the surface of the moon, a body’s weight is only one-sixth that on earth; that sounds like fun, and astronauts Armstrong and Aldrin and their successors have already reported that indeed it is. (We saw them bouncing around on television, bundled and burdened though they were.) When we have colonies in natural or artificial caverns on the moon, we could have a wild variety of new games and modifications of old games.

Plain and fancy jumping might alone be fun for even a jaded spirit. High-jumping and pole-vaulting will be dream-like experiences with slow-motion artistry. Probably we will run faster (-leaning forward more), but bow much faster seems uncertain. We will jump higher, but the new high-jump record will not be anywhere near 40 feet. (The high-jumper on earth, who clears a 6 foot bar, raises his center of gravity only about 3 feet, which means that, if he could get the same spring on the moon, he could clear about 21 feet.) The platform diver will be in the air roughly 2-1/2 times as long as on earth, before hitting the water, thus having time for the most beautifully intricate convolutions. (Time of fall is inversely proportional to the square root of the gravitational acceleration.)

Tennis will require a whole new set of responses. Serves, of course, will start higher, since the server can jump higher. The ball will travel in flatter trajectories; it will rise and fall more slowly, while the horizontal motion remains unchanged. In volleyball, also, trajectories will be flattened; this does not mean the net will be much higher (which would merely produce a slow, boring game) but that the ball will seldom be hit upward to any degree, nearly always horizontally or downward. Billiards, on the other hand, will be affected scarcely at all.

Swimmers will go much faster. You will not float any higher in the water, since the water’s weight is reduced as much as yours; but using swimming strokes to raise yourself partly out of the water will be much easier, and there fore swimming will be faster. It is even possible that, with a good deal of exertion, you could “walk on water,” i.e., tread wa-

Even more exhilarating than these games, however, will be a completely new one--flying. Not gliding, or parachuting, or powered flying, but using your own muscles to activate wings attached to your arms, like Icarus. (See also Chapter 4.) This is impossible on earth, because the muscular strength and the energy requirements are far beyond the ability of the strongest man; but with weight reduced by a factor of 6--with a 180 pound man weighing only 30 pounds--it should become feasible. (If necessary, the air in the flying cavern could also be made denser than one atmosphere, to make the flying easier.) What fun, and what a whole new world of sports in three dimensions! If professionals play these games, or zealous amateurs, they could be more dangerous than ice hockey, with damaged wings causing falls from dangerous heights. (And uninjured teammates will make daring power dives in rescue attempts, etc., etc.)

Back on earth, under the seas, there will likely be another new world of sports and adventure, again in three dimensions, predicated on radical new developments in underwater adaptation. Perhaps we will submit to biological modification that will permit us to use oxygen with extreme efficiency. We may learn actually to breathe seawater. Or we may just develop miniature gadgets that will protect us from the water and extract oxygen from it. In any case, the feeling would be one of naturalness and freedom. Diving to the murky depths, rising to the sparkling surface, roaming the forests of seaweed, exploring the canyons of coral, hunting the shark and the squid--here, alone, excitement enough for an ordinary lifetime!

**The Code Duello**

Relative to our billionaire status, meat will be cheap. Even human meat will be cheap. (Yes, there will probably be “cannibals,” some will try, and like, human flesh grown in culture; but this isn’t what I am getting at.) Not only tissues, but organs and even whole bodies will be reason-ably priced as replacement parts. (The brain, of course, cannot be entirely replaced without creating a new
person.) This opens up interesting possibilities in aggressive sports.

So long as the brain is protected, one could indulge in occupations, including sports, of any degree of roughness, including “fatal” injury. Karate could become a spectator sport—real karate, not throws but blows, intended to kill or maim quickly. The death suffered by the loser would not be as permanent as it would be now, but it would be just as painful.

Will some of us actually accept risk of dreadfully painful injury, even the physical experience of “death?” Certainly—for kicks. Fairly large numbers of people might be involved, not just a few masochists and sadists. The reason is obvious: many of us need the kind of stimulation and catharsis to be found in fierce physical combat. At least occasionally (especially when life is long and safe) we may need to “get back to nature,” to test our muscles and reflexes and nerves, to rejoin contact with the hunter, the warrior, the beast of prey.

One can only speculate as to the degree of indulgence in mortal combat, and the social institutions that could grow up in connection with it. As already indicated, it would partly be involved with spectator sport—and the champions may become trillionaires. Again, there may be whole subcultures centered around combat, as there are now around drag racing and surfing. And it may even permeate ordinary society in the form of a duelling code.

Many years ago Robert Heinlein wrote a novel about a future society, Beyond This Horizon (73). He postulated a duelling code for two reasons: to enforce good manners and to breed people with faster reflexes. The latter notion seems silly in terms of cost and alternatives, but there is something rather charming about the former idea. The idea has many obstacles and defects, but it has flourished in the past in various places, and persists to this day to some extent. (There are many places where public rudeness invites a rap in the mouth.)

It should not be thought that, just because permanent death is not allowed, combat will lose its challenge. It will take real courage to fight to the “death.” After all, ordinary fist-fighting involves scarcely any risk—one seldom suffers anything worse than a black eye or a broken nose—and yet most people are rather timid about fisticuffs. Saber-duelling, as at the German universities, risks only some superficial cuts on the cheek, and yet many lack the nerve to engage in it. When it comes to having your arms broken, or your testicles crushed, or your eyes gouged out—well, the polo-playing millionaires of today will seem like small potatoes.

Wall-to-Wall Grass & Homes Without Houses

The word cybernetics, coined by the late Professor Norbert Wiener, refers to communication and control, and especially feedback, in mechanical systems—organization of a type which frequently mimics aspects of living organisms. But it will also often be useful for life to imitate art, for living organisms to be designed that copy certain features of mechanical systems or that are subject to mechanical controls. Certainly biological machines can be extremely flexible, and can utilize a degree of miniaturization not yet even approachable in any other way.

One of the obviously desirable features of many utilitarian devices is the capacity for self-repair, which is typical of living things. Your carpet, for example, will never wear out if it is a surface of living grass; it could be designed to grow just fast enough to compensate for wear, and only in those places where wear occurs. As for luxury, is there any carpeting of wool or silk or synthetic fiber that can compare with a lawn of bent grass?

Your indoor lawn, your living carpet, might also have features of flexibility and adaptability not to be found in the products of Persia. For example, each blade of grass could be given a different color, changeable at will, which means the pattern could be altered as frequently as you wished. At one stage in history, designing patterns for grass-carpets (and for clothes, furniture, walls, etc.) will become too complex for the home computer, but will be individually available, at a moderate fee, from a commercial computer. For a small monthly charge, your commercial designer could send periodic instructions to your home computer, which in turn
would implement the new carpet art. Each day, if you wished, you would be pleasantly surprised at the change in decor.

This decor could be chosen to carry further the garden theme consonant with the carpet of grass. Living, growing flowers could be permanent indoor features, again with characteristics of extreme flexibility. You could sleep, if you liked, in a bower of roses; you could awaken, if you wished, to the smell of mint, and go to sleep, if you liked, to the scent of honeysuckle. Making the necessary radiant energy available for the growth of these neoplants, and the required nutrients, would be a matter of detail that would certainly offer no serious obstacle.

With grass and flowers all around, the indoors would seem a good deal like the outdoors. We can go even further, in view of our coming control over weather: we could leave off the roof, and be outdoors, snug in our own pocket of metered and controlled micro-weather. We could allow rain to fall just beyond the rooms, and lull us to sleep. If we have enough room or gadgets for privacy, we could even forget about walls, and give our living areas an outward look of open gardens. Compared with this, the flossiest of present mansions will seem no better than a stinking cave.

*The House Dutiful*

Ways will probably be found to make the micro-environment extremely sensitive and responsive to us; the home, in particular, will be a wonder of care and solicitude on many levels.

*This term is due, I believe, to William Tenn.*

In the present primitive state of affairs, although the best homes have some degree of flexibility, active and conscious control is almost universally required. Occasionally a door has sense enough to move aside when someone approaches; virtually all other functions demand either individual control or adjustment of automatic parameters. Room air is sometimes controlled by thermostats and humidistats, for example, but these stupid gadgets maintain the same temperature and humidity regardless of your changed feelings or inclinations, and you must actually make a decision, walk over and reset the control if you want a variation.

There exists a type of glass that darkens when the sunlight on it is brighter, so that roughly the same intensity of light is transmitted at all times; but the idiotic glass pays no attention to whether your eyes are open or closed, let alone to what you are thinking or feeling. How barbaric!

The future run-of-the-mill billionaire’s home, and the computer at its core, could have capabilities several orders of magnitude higher, and a built-in sense of mission. The effect would combine elements of a super-efficient staff of servants, a faithful dog, a Jeeves, a maiden aunt, a genii, a physician, a bodyguard and a psychiatrist. It would react not only to what you and others do, but to what is said, thought and felt; and it would not only take orders, but would make suggestions and take initiatives.

Beds and chairs, for example, could contain sensors for reading your physiological variables and referring these to the computer for diagnosis. (There already exist diagnostic machines and diagnostic computer programs.) Depending on its estimate of the kind and degree of dangers, the house might make suggestions, slip something in your drink or in your air, refuse to give you another drink unless you actuate the override, or call for help. (Speculative writers have sometimes imagined homes that could also go berserk, make love, and so forth; but I shall ignore such possibilities.)

Adjustment of such factors as temperature, humidity, electrical charges in the air, sub-threshold or super-threshold background noises, would be made through responses to many subtle signals. The super-home could easily sense the amount of perspiration on your skin, for example—in fact, the pattern of perspiration on your body—and would correspondingly adjust the composition of the air in various places and the design of the room’s breezes. But it could also pay careful attention to the pattern of your behavior, reading carefully all the small clues in your shifts and twitches, to deduce the existence and nature of any discomforts or desires. Furthermore, it would hear your sub-vocalizations and monitor your brain waves,
which would make it very nearly, if not fully, a mind reader.

Such ideas may seem decadent and repulsive to some. Do we really want to be cradled and massaged, pampered, and coddled? Do we want to be hovered over by a simpering servant? Is not life more than lying on perfumed couches, waiting for the peeled grapes to drop into our mouths?

Certainly there are individuals, and there have been whole cultures, having the belief that vigor and virtue demand a rugged way of life, or at least a simple and frugal way of life. It is also true that ease can lead to sloth, and sloth to disaster; but this is not necessarily true. We would not improve ourselves by exchanging our mattresses for beds of nails, and it is unlikely that the Japanese owe any part of their success to wooden pillows. On the contrary, ease and comfort at the appropriate time almost certainly tend to increase general efficiency and the capacity, again at the appropriate time, to work hard and fight hard. We must remember that the super-home would not be just a “house,” and the central computer would not have the attitude of a Madam pandering only to sensual desires. It could have whatever attitudes you and your advisors build into it, and it would look out for your larger interests. So long as you permit, it could give you an argument when your welfare seems to demand it, and take over some of the wifely functions of prodding and nagging; to a considerable extent, it would be a kind of prosthesis not only for your hands and brain, but for your conscience. How far it can go in these directions, and how effective it can be, will naturally depend on the rate of development of artificial brains; as in all else, there will be constant change and improvement.

The Era of Self-Sufficiency

The greatest of all inventions, in many respects, will be the self-improving (and, if desired, self-reproducing) robot, the machine with no fixed limits to its intelligence or to its physical capabilities. A source of potentially limitless power and improvement, it will pose profound problems of several different classes, only one of which is now considered here, viz., that of the self-sufficient individual or family. Automation and robotics will reach their culmination in the all-purpose thinking and actuating machine, which will supply its owner with endless merchandise, advice and services. (The merchandise, whether ermines, artificial hearts or spaceships, could be made from any materials at hand, even plain air, soil, and water; the advice might take such forms as improvement in the owner’s mentality and the services could include the surgery that might be necessary to implement that improvement.) One of the results, clearly, would be the emancipation of the individual (or family) from dependence on society, at least for most purposes. How far will this independence extend, and will it be good or bad?

(I bypass the question, considered elsewhere, of why the machine should remain subservient to its owner, remarking only that one possible solution is for the machine, or certain aspects of it, to be an extension of the owner, integrated with his mind through suitable links.)

Individuals, couples, families, or communities of any size will probably be able to isolate themselves-by distance, physical barriers, or simply by rules-and go their own way, and there is much good in this; it provides nearly the ultimate in freedom and diversity and eliminates many sources of conflict. (You are unlikely to quarrel with someone if your paths do not cross, although the American Indians did seek each other out, on a nearly empty continent, to make war.)

One can build an idyllic picture of countless free spirits, each the owner of wealth to glut a million sultans, each a master of a genie of bottomless resources, each the king of his castle and the ruler of his realm, yet each a gypsy, not rooted in any turf, whose star-wagon can carry him over the gulfs of space as across the chasms of the mind.

Answers-of a sort—are to be found for every objection. Does a king require subjects? Not necessarily, for his mastery can include his own psychology, and he may excise, by psychological or even physical means, any unhealthy leanings; or, alternatively, he could create suitable robot subjects, with desired responses, possibly even including intelligence, but without genuine feelings. (There will probably be both kinds of automatæ—those...
with self-awareness, which would be “people,” and those without.) Or a family, or small community, might for a time find a stable set of relationships which would harmlessly allow a pecking order; when the order begins to chafe, those who are uncomfortable presumably would be allowed to have their own general-purpose robots built, and strike out for themselves. Anyone who insists on his prerogatives as the head of the family or community can always raise another family --and even design the desired traits--although it is difficult to imagine a personality that would require that kind of satisfaction indefinitely.

Is there a danger to the larger human community in allowing such freedom to individuals? Might not some instruct their machines to concentrate on growth and weapons development, with a view to conquest? Does not the welfare of children--and even of all citizens--require some degree of government and paternalism? And would not such splinter-isolationism border on chaos, with even newsgathering reduced to haphazard gossip and progress to a random walk?

Such questions cannot yet be answered with any degree of confidence, because the answers depend sensitively on parameters still unknown, on the historical development of culture and human biology. My own thinking--wishful, as usual--is that sense, prudence, and empathy will prevail, and that we will indeed be able to combine nearly complete freedom with a suitable degree of cooperation and intercourse. Such a culture would represent very nearly the ultimate our minds can presently conceive in any detail; beyond this, the outlines of destiny will depend on discoveries and concepts still in the future.

NEXT ISSUE:
Part 9 - “Tuesday in Eternity”