ALCOR LIFE EXTENSION FOUNDATION

CRYONICS

3RD QUARTER 2008 · VOLUME 29:3

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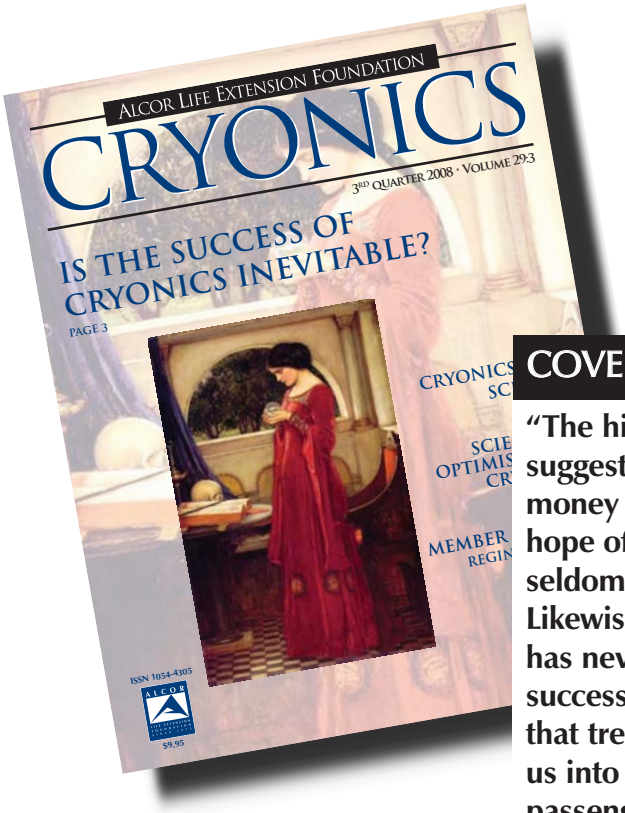

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"The history of technology suggests that throwing money at a problem in the hope of a quick fix has seldom been productive. Likewise, sitting and waiting has never been a strategy for success. The happy conceit that trend curves will carry us into a beatific future, like passengers on a Disneyland ride, goes even beyond optimism, into hubris."

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ALCOR LIFE EXTENSION FOUNDATION
CRYONICS

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FROM THE EDITOR

So much has happened at the Alcor Life Extension Foundation since the last issue of Cryonics Magazine that the space allowed for this editorial would not do justice to report on it here. It is better to let the content of the upcoming issues of the magazine reflect those changes. One thing that *did* suffer in the second half of 2008 was the magazine itself. When I was made editor of the magazine we discussed whether to skip the last two issues for 2008 but decided that we want to give Alcor membership (and paid subscribers) what we owe them, and here is the result.

When word got around that I had become editor of Cryonics Magazine some people spontaneously offered contributions and this produced a rather unexpected result. Although I did not intend a specific theme for this issue, I suddenly found myself in possession of a number of critical pieces about the relationship between futurism and cryonics. This is not completely new territory. On August 14, 2006, ex-Alcor President Steve Bridge initiated this debate with his online piece *Has Cryonics taken the Wrong Path? The Unnoticed Conflict between Rescue Technologies and Futurist Philosophies.*[1] It is telling that Bridge chose the phrase "futurist philosophies" and not "futurist science."

Perhaps it is a sign of the times that some of us do not feel so comfortable any longer about the pace, and even the inevitability, of scientific and cultural progress. Cryonics remains a marginal movement. Major breakthroughs in aging and cell repair technologies remain largely theoretical. And the predictions of many futurists have turned out to be a source of amusement for cynical observers. Perhaps the question to ask ourselves is not so much "what has gone wrong?" but "what were we thinking?"

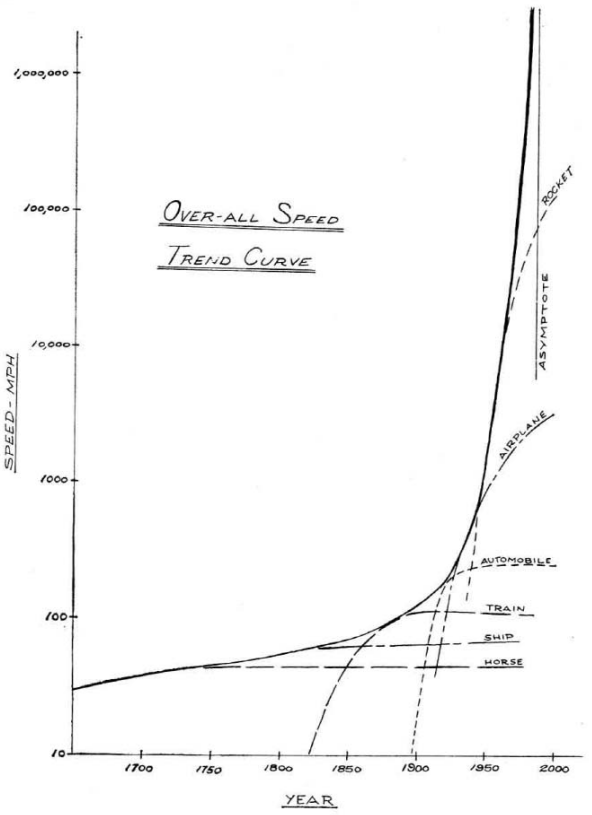
A common theme that unites the articles in this issue is the demarcation between science and wishful thinking. Is cryonics a science? If it is not a science, what is it? Can we predict the future? And if we can, is the resuscitation of cryonics patients inevitable? How has our (unconscious) optimism about technological progress affected the organizational and service delivery aspects of cryonics? Can we make a stronger case for cryonics than simply stating that a small chance of survival is better than no chance at all? What is the strongest empirical evidence that supports the idea of cryonics, and can it be used to engage mainstream medicine in a constructive dialogue? These are some of the questions that are raised by the contributors in this issue.

A member profile on Alcor's readiness coordinator Regina Pancake has been long overdue. Regina strongly believes that active membership participation and hard work are necessary for cryonics to succeed. In this assessment she reinforces the perspective of the other contributors. We simply cannot afford to be passive consumers of cryonics.

[1] *Has Cryonics taken the Wrong Path? The Unnoticed Conflict between Rescue Technologies and Futurist Philosophies.* http://www.alcornews.org/weblog/2006/08/has_cryonics_taken_the_wrong_p.html

INEVITABILITY

By Charles Platt



*In May 1961, **Astounding Science Fiction** magazine published this curve by G. Harry Stine purporting to prove that human travel would achieve infinite velocity before the year 2000. The idea was absurd, yet extrapolation of trend curves is stil a favorite tool of futurists seeking to justify optimistic predictions. (Note that the y-axis has a logarithmic scale.)*

When I first signed up for cryonics, I started discussing it with my friends to see if they would find the choice as obvious as I did. This turned out to be a sobering experience.

A science-fiction writer whom I'd known for many years looked at me with growing astonishment as he grasped the extent to which we must rely on future science to make repairs on a cellular level. "Your organization is like a company selling tickets to Mars," he said, "even though you don't have a spaceship. In fact you don't even have the money to build a spaceship. You don't have a *plan* for a spaceship. You're expecting other people to design it, build it, and test it, and pay for it—and then give you a free ride!"

Of course I responded with the usual arguments about the Singularity, artificial intelligence, nanotechnology, and the high ratio of benefits to cost in the coming Diamond Age. I told my friend that these developments were inevitable.

My friend just laughed and said that I was unrealistically optimistic.

That was twenty years ago. Today, I feel a little less certain that I was entirely right and he was entirely wrong. I feel forced to conclude that cryonicists do tend to suffer from excessive optimism, which creates significant problems in the field. And I don't use the word "inevitable" anymore.

Hazards of Curve Fitting

A primary reason for my change of attitude is that I have seen so many failed predictions. This is one of the few benefits of age: You accumulate an increasingly comprehensive overview of other people's mistakes. Again and again I've found really smart people making disastrous judgment calls regarding future developments that they regarded as "inevitable."

My favorite, oldest, and most extreme example is an article by G. Harry Stine titled "Science Fiction is too Conservative," which appeared in the May, 1961 issue of *Astounding Science Fiction*. Stine analyzed a bunch of trend curves and came to some conclusions which he insisted were entirely factual. "The speed trend curve alone predicts that manned vehicles will be able to achieve near-infinite speeds by 1982," he wrote, pausing only to add that "It may be sooner." As for the trend curve for controllable energy, Stine deduced that by 1981 "a single man will have available under his control the amount of energy equivalent to that generated by the entire sun."

The problem, of course, was one of curve fitting. Stine thought he was dealing with exponential curves—functions that continue to double indefinitely. In reality, the curves all flattened out. They turned out to be S-shaped.

I trust Ray Kurzweil considerably more than G. Harry Stine, because Kurzweil is a brilliant innovator who has spent years gathering and analyzing trend data. Still, I see him doing exactly what Stine did 45 years previously. On Kurzweil's web site, his paper titled "The Law of Accelerating Returns" includes numerous curves showing what he describes as exponential growth, especially in areas related to computing. And if anyone doubts the affordability of future tech, he includes a curve for American GDP—which implies a future of endlessly accelerating growth, while reducing the Great Depression to the status of a tiny pot-hole on the road to techno-transcendence.

Perhaps optimists such as Kurzweil could learn some lessons from the pessimists. To take the most obvious example, the greatest doomsayer of the twentieth century, Paul R. Ehrlich, confidently asserted in 1970 that population growth would devour the planet, causing mass starvation and the total depletion of vital resources. He made this determination based primarily on the trend curve for population growth, which at that time appeared to be exponential.

In subsequent decades, even the "low" population predictions from the United Nations had to be revised downward, and still farther downward, as the human race went through a change now known as the "demographic transition." This is the reduction in birth rate that has occurred spontaneously in societies where increasing prosperity has changed parents' perception of children from being a financial gain to a net financial burden, while at the same time, social programs have made adults less dependent on

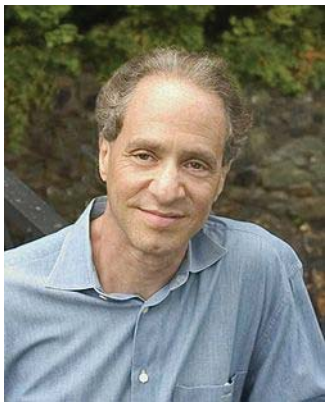
children to support them agriculturally into their old age.

Thus the human growth rate has turned out to be just another S-shaped curve, and worldwide, 20 nations were listed in 2007 as having zero or negative annual growth rates. This was inconceivable to Ehrlich just 45 years previously—a salutary lesson for anyone who uses trend curves to predict the future on the basis of the past.

Implicit Assumptions

To be fair, some very smart people who are signed up for cryonics have taken the trouble to figure out exactly how brain repair may be achieved. I greatly respect Drexler's *The Engines of Creation*. I admire the audacity of Merkle's famous article, "The Molecular Repair of the Brain," and I am awed by the huge amount of rigorous work in *Nanomedicine* by Freitas. Yet even among these great writers I find implicit assumptions which seem based purely on optimism, especially regarding artificial intelligence, which is an essential pre-requisite for large-scale cell repair.

Strong AI has become such a fundamental concept in the cryonics community, the Singularity is seen as yet another inevitability. Vernor Vinge, who invented the term, has said he expects it no later than 2030. Ray Kurzweil seems unwilling to nail it to a specific year, but has no problem predicting that it is "near."

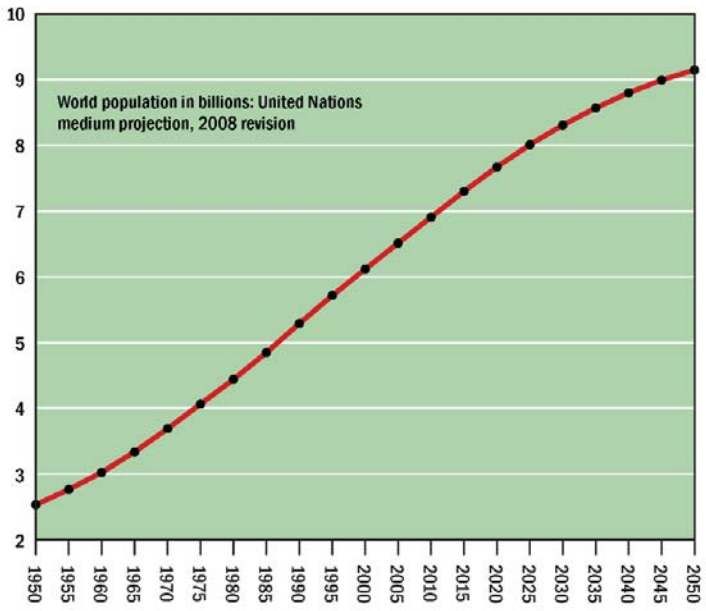


Ray Kurzweil

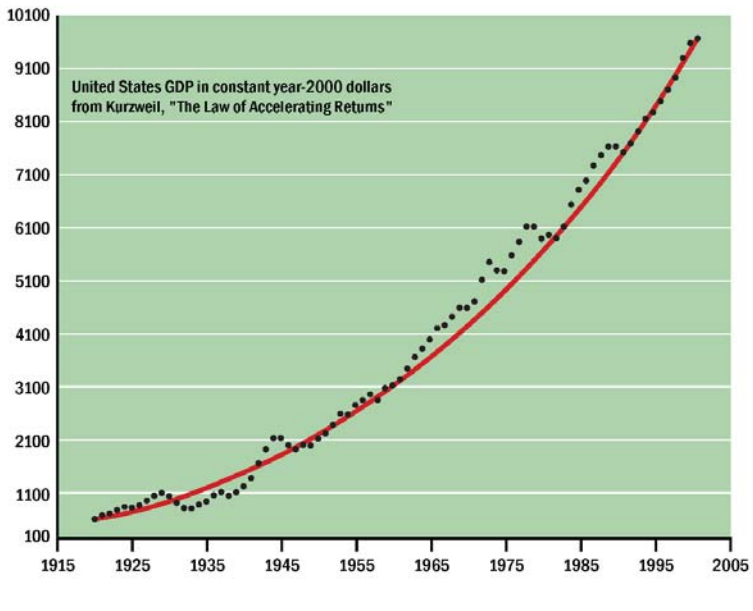
I like to think that Vinge and Kurzweil are right, but I can't help remembering prophets from the past—such as Karl Marx, whose detailed observations of industrialized society led him to conclude that communism was not merely desirable, but inevitable. Marx may seem unsophisticated and deluded compared with today's futurists, yet today's futurists may seem just as unsophisticated and deluded a century from now. At the time Marx propounded his theory of history, his work was rigorous, based on years of research, and convinced millions of intelligent people (many more than Kurzweil has persuaded so far). Moreover the "inevitability" of collectivism was one of the major arguments for accepting it. Since it was going to happen anyway, you'd be a fool to fight it.

Today's advocates of nanotechnology said exactly the same thing to Bill Joy in response to his handwringing in *Wired* magazine. "Learn to live with it, because you'll have no choice," was their message.

I certainly hope that today's techno-optimists turn out to have a better predictive track record than Karl Marx, Paul R. Ehrlich, G. Harry Stine, or the other legions of discredited prophets. I have always enjoyed sudden, disruptive change, and would like to see more of it. But the sad fact is, none of the predictions which I read about in the 1960s has materialized. Flying cars, space colonies, human clones, domestic robots, conversational computers, a cure for the common cold, a cure for cancer—the future has failed repeatedly to conform with projections by futurists. In fact I cannot find one sweeping prediction since World War II that has come true, unless you count Clarke's idea



The population growth rate that once appeared to be exponential is now projected to be just another S-curve. How many other future developments will follow a similar pattern? Cryonics fails if technology encounters diminishing returns.



Ray Kurzweil seems to believe that future growth in GDP is inevitable; yet 90 years of history are a small base from which to extrapolate human wealth during the century or more in which cryonics patients may have to wait for reanimation. In the natural world and in human society, ongoing exponential growth usually runs into some kind of limit.

Arthur C. Clarke

for communications satellites. Even there he was completely wrong about the consequences, since he believed that communication across borders would bring about world peace. As for his more general predictions about humanity moving into space, the movie *2001* now looks like a piece of Hollywood nostalgia. More than one-third of the people now living in the United States have not seen a man walk on the moon in their lifetime.

Clarke never abandoned the vision he predicted for *2001*. "It will all still happen one day," he said when I interviewed him in 1980, "but not on that time scale."

The trouble is, as cryonicists, we have more than an academic interest in the timeliness and accuracy of predictions. We are betting our lives on them.

The Quick Fix

In cryonics I have come to the conclusion that excessive optimism is not just misleading but destructive, as it encourages errors which cost time and money. Specifically, I have seen cryo-optimism leading to periods of complacency punctuated by quick-fix opportunism.

In the real world, maintaining standby capability and going out to do field work are unglamorous tasks requiring patience, stamina, self-criticism, and attention to detail. Likewise, research to develop better cryoprotection entails a lot of toil, as good lab work demands the elimination of uncontrolled variables and the demonstration of repeatable results.

Among cryonicists who feel impatient to achieve human transcendence, such drudgery has never been very popular, and a quick fix has always been a tempting alternative. Indeed the original model for cryonics can be viewed as one big quick fix, since it suggested an end-run around the incremental labor of conventional research. Supposedly, we could just freeze people with whatever primitive means were available—in someone's garage, if necessary—and leave the problem of damage repair to someone else. This outlook actually discouraged research, because it led reputable scientists to disassociate themselves from the field.

Since cryonics was established on that basis, we should not be surprised that more quick fixes followed. I regret that this is a depressing list, but I have always believed that we should confront our errors as a first step to avoid repeating them.

One notorious cryonics pioneer seemed to believe that if he just crammed as many bodies as possible into a Dewar, he didn't have to worry about the difficult process of obtaining funding, because donations would somehow arrive in time to assure the uninterrupted supply of liquid nitrogen. This quick fix fuelled by misplaced optimism led to the biggest scandal that cryonics has ever known.

Another widely respected mentor advocated the procedural quick fix of letting funeral directors deal with cases. More than forty years later, he still seems hooked on this model, thus avoiding the challenge of funding, training, and maintaining a standby team.

The same man has expressed a lifelong belief in the "celebrity quick fix," in which one key event, such as the cryopreservation of a particularly well-known person, may precipitate a landslide of applications for cryonics membership.

Many others still have hopes for this concept. A former Alcor president once confided in me that he had expected the Ted Williams case to bring in 10,000 new members—and although Alcor board members at that time were a tad less optimistic, they seemed to feel that the case had positive potential. In reality, of course, it resulted in no membership growth and became a PR disaster.

Perhaps the most embarrassing quick-fix episode occurred when CI and Alcor each spent $25,000 to share exclusive rights to Olga Visser's miracle cryoprotectant, which she claimed would enable rat hearts to resume beating after immersion in liquid nitrogen. To their great credit, an incoming Alcor administration organized a public demo which showed beyond reasonable doubt that Visser's method was a failure. Still, a few years later, the same people succumbed to their own quick-fix optimism when they founded a DNA-preservation business in the sincere belief that it would generate funding for Alcor for the indefinite future. The flow of money turned out to be opposite to that which they had expected, and they resigned their positions at Alcor amid a bout of recriminations.

We all make mistakes (certainly, I have) but undue optimism creates opportunities for more and bigger disasters than a more balanced worldview.

Again and again I've found really smart people making disastrous judgment calls regarding future developments that they regarded as "inevitable."

Complacency

The other fallout from optimism, complacency, has been a problem in cryonics from the very beginning. When pioneer Ev Cooper coined his slogan "Freeze, Wait, Reanimate," his use of the word "wait" suggested that this was all we had to do to enjoy eventual reanimation and biological immortality.

Some people were unconvinced. Saul Kent, for instance, saw the need to fund research, while Curtis Henderson tackled the unrewarding labor associated with running an ethical cryonics organization and freezing people, with minimal help and funding. Later, Mike Darwin and Jerry Leaf emphasized the need for rigorous lab work and standbys. But these individuals tended to be exceptions, and their advocacy of hard work was never very popular. When Henderson made his occasional proclamation that "There is no such

thing as feelgood cryonics," I used to see people edging away from him.

The majority outlook was, and still seems to be, that after you make your signup arrangements, you really don't need to do anything. You can go about your everyday business in a carefree state of mind until you need to be cryopreserved, at which time diligent and highly trained team members will wait patiently by your bedside until cardiac arrest, and will do whatever it takes to rush you to the cryonics facility. The world's most advanced cryoprotective solution (privately developed at a cost of many millions of dollars) will be perfused through your brain and body in a purpose-built operating room, you will be safeguarded from deterioration for a century or more, and eventually you will be repaired and revived (at no additional charge) by technology with almost unimaginable powers—all for the cost of a life-insurance policy and a modest annual membership fee.

For financial reasons alone, I think you have to enjoy optimism-induced complacency if you really expect this to happen with no additional effort or payment on your part.

Foundation Work

The history of technology suggests that throwing money at a problem in the hope of a quick fix has seldom been productive. Likewise, sitting and waiting has never been a strategy for success. The happy conceit that trend curves will carry us into a beatific future, like passengers on a Disneyland ride, goes even beyond optimism, into hubris.

Since even the most rigorously based predictions of the future have been almost 100 percent wrong, and every quick fix that I can think of in the history of cryonics has been a failure or a disaster, maybe it's time to get a little more serious.

We do have a few good role models whom we might emulate. I greatly admire the people whom I see studying neuroscience or trying to develop the artificial intelligence which may lead, eventually, to the strong AI that seems an essential prerequisite for cell repair. Likewise I admire the scientists struggling to develop better methods of cryopreservation, to minimize the damage that we create today and thus reduce our dependence on unknown technology tomorrow. And for those (like me) who lack scientific qualifications, there is always the unappetizing prospect of participating actively in the imperfect processes of standby, stabilization, and transport, in the hope of making them more reliable and more effective in the future.

Going back to my science-fiction-writer friend's analogy: To ride that spaceship to Mars, at the very least, we may have to establish some foundations for the launch pad. And if we hope to sell the concept to skeptical outsiders, they'll take us a little more seriously if they see us working rather than simply waiting. ■

Charles Platt

Charles Platt is a past president of CryoCare Foundation. He managed standby, stabilization, and transport for Alcor in 2002-2003, was general manager of Suspended Animation in 2005-2007, and has participated in the development of liquid ventilation for rapid cooling after cardiac arrest.

References

Ray Kurzweil's "Law of Accelerating Returns" is at www.kurzweilai.net/articles/art0134.html

Paul R. Ehrlich's most sober predictions were in his book *Population, Resources, Environment,* coauthored with Anne H. Ehrlich and first published in 1970.

The concept of "demographic transition" is summarized in a Wikipedia entry.

UN population data and projections can be found in links from www.un.org/esa/population/unpop.htm

Zero and negative population growth rates are listed at http://geography.about.com/od/populationgeography/a/zero.htm

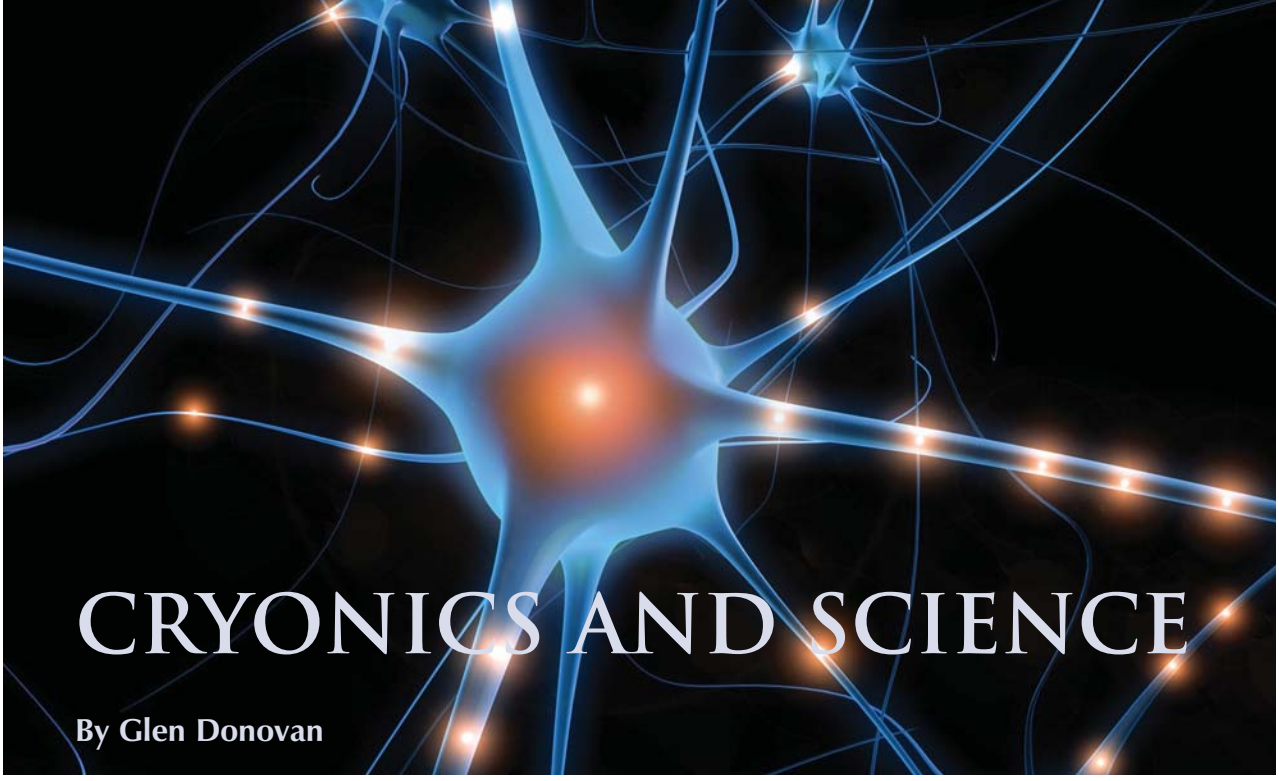
Merkle's article on "The Molecular Repair of the Brain" is archived at the Alcor web site.

Vernor Vinge's prediction of the Singularity by 2030 has been cited in many places, including Wikipedia.

Bill Joy's "Why the Future Doesn't Need Us" appeared in *Wired* 8.04, April 2000. Responses were circulated among participants in a private email discussion list.

Clarke's prediction of world peace through communications satellites appeared in his book *Prelude to Space,* published in 1953. Platt's interview with Clarke was published in the book *Dream Makers,* in 1980.

Olga Visser performed her experiment during the Alcor Cryonics Technology Festival in February, 1997. This was published in *CryoCare Report*, issue 10. The $25,000 fee paid by Alcor was confirmed by former Alcor president Steve Bridge.



CRYONICS AND SCIENCE

By Glen Donovan

Is cryonics a science? Is it scientific?

Cryonicists are divided on how they view the relationship between science and cryonics. Some view cryonics as a proto-science, a new science just beginning to develop. Others regard it as already science and scientific, fully engaged in the scientific method. Most non-cryonicists view it as, at best, "borderlands science" (in Michael Shermer's words[1]), or at worst, pseudoscience and fraud.

Science comes from a Latin word meaning simply "knowledge" and it has come to characterize the empirically verified body of knowledge we have. The scientific method is a method for discovering knowledge, and part of this method is testing hypotheses or theories by experiment. So hypotheses play a crucial role in the scientific method, but hypotheses are not scientific facts; in fact, the scientific method depends on distinguishing hypotheses from empirically verified facts.

Science is also a permanently ongoing research project, in which the scientific method is used to extend the boundary of what is known. Because progress in science requires time (as well as effort), the status of what is known depends upon the state of present research. At any given moment, some things are unknown, some things are hypothesized, and some things are being tested. Hypotheses can be born in the ground of broad speculation, but at any given moment, the difference between what is known and what is not known is usually clear. Hopefully, though, as time goes on, if all goes well, more and more that is unknown becomes known, and more and more hypotheses are either confirmed or falsified.

Many researchers chasing a hypothesis might do so because to them it seems probable; they have a hunch it is right. But without any relevant evidence, how does one calculate the probability of being right? It is usually not so important to calculate this likelihood as it is to put one's hunches to the test in the present.

When scientists are asked about cryonics, they are bound to make certain observations. One, is that no one who is cryopreserved can be resuscitated *now* – but that *now* is not an arbitrary limitation. It is required by science progressing through empirical experiment. If it has not been determined now, in a sense, then it is not known for sure. So even though resuscitation might be possible someday, science requires us to clarify it is not known now how to do it.

There is also no reason to be certain that it *will* be known how to resuscitate cryopreserved persons someday, as if one could surely predict it based on other known phenomena today. So the future possibility of resuscitation from cryonics is also unknown – it is not a scientific fact[2].

On the other hand, one could argue the case for the *theoretical possibility* of resuscitating cryopreserved persons is based on reasonable inferences from what is known. Most good hypotheses are warranted by creative but careful extrapolations from existing evidence. They may even be characterized as theoretically possible, if no existing evidence would seem to contradict them. But especially for cryonics, it is not enough to demonstrate *theoretical possibility;* rather, it is necessary to demonstrate practical possibility. Scientific research engages tractable hypotheses, hypotheses that can be put to the test in the present.

Unfortunately, cryonics, in the sense of cryopreserving people in a way that can allow them to be resuscitated in the future, cannot be put to the test in the present. Some cryonicists describe cryonics as an experiment, in

[1] http://www.michaelshermer.com/2001/09/nano-nonsense-and-cryonics/

[2] In theory, one could make an evidence-based, quantifiable case for the likelihood of particular kinds of progress in science, but it is unclear that one could raise the likelihood to predictable certainty in this way.

which cryopreserved persons are the treatment group, and noncryopreserved persons are the control group. But what is the treatment? Because there is no attempt in the present to resuscitate cryopreserved patients, the theory is not being put to the test. Cryopreservation might at best be able to be described as preparation for a *future* experiment, in which the experiment would be the resuscitation attempt.

In fact, if the goal of cryonics is to return the cryopreserved to an indefinite, healthy, youthful life,[3] resuscitation from cryopreservation is just the tip of the iceberg of what would be necessary to be able to make cryonics truly successful. In order to be successful, cryonics would require the development of thorough rejuvenation medicine and medicine to repair all injuries and cure all possible illnesses and conditions. Cryonics also makes certain assumptions about the quality of life in the future and the ability of people alive today to adapt to life in a perhaps distant future time. So cryonics depends not just on one unknown, but an entire set of unknowns. Each one amplifies the critical doubt science requires us to have.

...for cryonics, it is not enough to demonstrate theoretical possibility; rather, it is necessary to demonstrate practical possibility.

Believing in any future achievement of science (or any future condition of the world) is not in itself scientific. It is not necessarily anti-scientific, though. It might even be probable or likely. One could argue that a hypothesis about the future is falsifiable by waiting long enough – but how long is long enough? For as long as an outcome is not known for certain, it is not science in the sense of what is known or reliably predictable. And scientific research does not just wait into the future to see; it experiments with what it can in the present.

Cryonics entails a belief in what the future of science and medicine and technology will be; it is confidence in a kind of progress and belief in a certain sort of future (for science and the world) that is not itself strictly scientific, or even a hypothesis except by stretching that word beyond its usual scientific applications. It is not, on the other hand, unscientific or unreasonable. But there is a reason why most doctors and scientists today dismiss cryonics, even if they consider it a remote, tantalizing possibility. They have a very clear grounding in their practice and the nature of what they would consider usable knowledge in science. This is why the general informed consensus of experts on cryonics is that it is unproven and that, if it represents itself as a science or a medical procedure, it would be fraud and misrepresentation.

The focus on cryonics as a treatment which will succeed through future technology can obscure the fact that cryopreservation, as merely an attempt to preserve living tissue in as close to a lifelike state as possible (or even a viable state) by low temperature, is in fact a scientific practice. Cryopreservation is present technology, not future technology, and the science of cryobiology is well established. Reversible freezing of small biological samples, including whole human embryos and some human tissues and organs, has been empirically verified. Its status is not theoretical, but factual; not just theoretically possible, but possible in practice.

On the other hand, reversible freezing of larger, more complex tissues and organs has been falsified with the methods used so far, and the attempts date back over three decades. The epistemological status of reversible freezing of whole human bodies or the whole human brain is thus clear – it is not, now, possible in practice.

Also, while it is now possible to demonstrate that the human brain can be cryopreserved, it is not known whether any method of cryopreservation of the brain is preserving what would be necessary to resuscitate a person mentally intact, even if it were possible in theory to reverse the cryopreservation. While cryopreservation, as a scientific practice, could test methods for preserving the human body in states as close to lifelike as possible, and thus with some theoretical possibility of viability after reversing, without the broader vision of cryonics, there would be no practical purpose in such cryopreservation.

Even though cryonics can use current medicine and sciences such as cryobiology to guide its practice, it does so only because it looks forward to future medicine and science. Cryonics uses current medicine and science in ways that have no present-day application. And future medicine and science are not – now – medicine or science – they are almost complete unknowns. Who will be resuscitating cryopreserved patients? What methods will they be using? When will they be doing this? Under what ethical guidelines will they be operating and what public policy will they be following?

None of these questions can be answered today, and so it is not hard to understand why the procedure of cryopreservation for cryonics is not widely practiced. It is not known how long the patients will be in cryopreservation, what the best methods of putting them and keeping them in this state would be, how they will be removed from this state (if it is even possible), or what the ethical and public policy context would be.

In combination with this general agnosticism is the outright pessimism of many scientists about the future progress of science and technology. Perhaps because practicing researchers are so familiar with the difficulties of their own projects – the many obstacles, setbacks, cost overruns, and so on – they are understandably more pessimistic about the pace and scale of future progress in science

While the evidence of past progress might be clear, science is not about believing, but about seeing – progress will be believed when it is seen.

[3] After all, it would be cruel to resuscitate someone who had died once, only to die again!

and technology. While the evidence of past progress might be clear, science is not about believing, but about seeing – progress will be believed when it is seen. Yes, it is precisely in the practice of science that faith and doubt meet, where critical research in new avenues is funded in the hope of success.

The pessimism of the general public can exceed that of scientists. The mass media typically projects the perils and problems of the present, projecting them into a future in which science and technology create new problems at the same time as they solve old ones. The public's doubt about future progress is amplified by pessimism about human nature, social and political obstacles, and the worldview that expects Apocalypse.

In contrast, cryonics entails a vision of the future – a world that will resuscitate cryonics patients is a world in which there is no death, no aging, no disease, and no irreversible injury or medical conditions of any kind. It is a world in which the dead can be raised; a world that has the resources and compassion to raise the dead and reintegrate them into their society.

I suspect that such a world is barely recognizable to most people today as a world that can have continuity with the world of today. It is already beyond a kind of singularity of the imagination. Its denizens break the categories of the human and the human condition. The only discourse (language tradition) that normally deals with such possibilities is religion.

In my opinion, it would be best if cryonicists continued to explore the boundaries between science, medicine, religion, and cryonics. It is important to explore why cryonics is rejected by the general public, and it is also important to understand why cryonics is rejected by prevailing science and medicine. It is especially important to cede the case that cryonics is not science or medicine.

If cryonicists better understood the criteria of science, medicine, and religion, they could better formulate new approaches to improving the practice of cryonics. Which aspects of human cryopreservation are scientifically tractable and could form the basis of present-day research? Could a strong case be made in a reasonable, quantifiable, way for particular kinds of progress in science and technology? Could preliminary discussions leading toward the formulation of public policy implications of longevity be organized now? What are the most useful ways to present cryonics practice now to the medical and scientific communities? What are the religious and philosophical implications of the current practice of cryonics and the vision of the future which cryonics assumes?

Cryonics today is too often hampered by its questionable status, its falling in the cracks between categories. The widespread rejection of cryonics may have arisen, in part, from a miscommunication between cryonicists and scientists, health care professionals, and the general public about what cryonics is, or is not, about what it might or might not be, and what sort of response cryonics calls for. If cryonicists more carefully examined the fields of knowledge and expertise and faith into which cryonics does not, currently, fit, they might be able to build bridges to those fields so that proper public evaluation of cryonics could begin for the first time. ■

Glen Donovan is the pen name of a vocal life extension advocate and Alcor member.

MEMBER PROFILE:

REGINA PANCAKE

By Chana de Wolf

"Having seen (and loved) her share of post-apocalyptic movies, Regina is determined to become a harbinger of good news for a change."

Cryonics is not an ordinary consumers' product. One way to improve your chance of personal survival is to participate in your local cryonics group to enhance the capabilities in your area. If you live in a part of the country without a local cryonics group and you would like to start one, contact Readiness Coordinator Regina Pancake at 480-905-1906 x100 or email at regina@alcor.org. Remember, you can make a difference!

A brief newscast about Alcor in the late '80s was all it took to capture Regina Pancake's interest in cryonics. Working in the film industry as the owner of two props and effects houses in Los Angeles not only fueled her imagination with the possibilities for future technology, it also positioned Regina for active participation in cryonics activities since Alcor was located in Riverside, CA, at the time. Always seeking involvement in what interests her, she immediately began volunteering at Alcor – building shelves here, hauling equipment there…but most importantly, meeting other cryonicists and creating networks of contacts within the community.

Fast-forward nearly twenty years, and you will find Regina largely doing the same. As Alcor's current readiness coordinator, Regina is, of course, deeply involved in the logistical aspects of preparing teams and equipment for standby and stabilization of Alcor patients. Prior to arriving at Alcor as a part-time employee in 2007 Regina helped run the Southern California transport team for over five years. In preparation for her current full-time position she received even more intensive cryonics training at Alcor and completed training for Emergency Medical Technician (EMT)-Basic certification. But above all, networking and collaboration have remained the major forces underlying her strategy for building stronger teams and better capabilities.

During Regina's "Former Eastern Block Countries" tour, July 2001; Romanian castle wall.

"I am a communicator," Regina says. "All too often I find that people are working in their own dark closets and not speaking with others

While working at WonderWorks in Chatsworth, CA, Regina did interiors of space shuttle mock ups for museums in 1990.

who can help them. I am big on collaboration. I like to pull people together in order to create situations in which things can flourish."

Such a perspective undoubtedly comes in handy as Regina works to expand Alcor's regional capabilities by recruiting and training team members all over the country and in the UK. By and large, the area with the heaviest distribution of members is California. Accordingly, Southern California has more than ten stabilization team members who meet for training six times a year. However, other regions don't have such density and require active solicitation and maintenance of member involvement on Regina's part.

"How I'll go about augmenting teams in need would be researching who in our membership would fit the bill, approaching them individually through email first, then phone call….Also by casting a wide net through advertising for these regions within our own magazine."

Regina stresses that the most important thing a member can do to improve their chance of personal survival (and that of others) is to take action themselves and get involved: "Call me! I can connect you with other members in your area. There's also an Alcor membership directory with the names and contact information of public members." The directory represents over one-third of Alcor's current membership of nearly 900 people and exists specifically for the purpose of engaging members with one another.

Regina notes that community participation has waxed and waned throughout the history of cryonics. Paradoxically, as membership numbers have grown members have become less active both at Alcor headquarters and within their own regions. "There was a lot more involvement with the community back then [the early 1990s]," Regina remembers. "Board meetings were a crowded affair, with up to 50 people attending. Now we're lucky if we get a dozen." Similarly, though the Internet now makes it easier than ever to find and connect with others, there are fewer cryonics interest groups holding meetings across the country, especially in areas that were once hotbeds for cryonics, like New York. Regina strongly encourages the use of such social networking sites as Facebook and Meetup.com to find other cryonicists and organize regular meetings.

While member involvement has taken a downturn, Regina beams when talking about the positive changes she has seen at Alcor over the years. "The organization has 'grown up' and matured a lot since I first became involved," she says. "For example, we no longer have people dumpster diving for equipment." Alcor's membership growth over the decades has provided increased support in the form of dues and donations to buy necessary equipment and supplies. Regina thinks this will eventually translate into an improved ability to professionalize research and rescue operations.

In 1997, during production of the first X-Files movie, Regina was one of the fabricators for Scully's cryo-chamber.

Working in a cooperative environment with the new transport coordinator, Aaron Drake, gives Regina even more hope for realizing such goals. Aaron is a paramedic and has a background in rescue and transport that complements Regina's strengths in readiness. "Working with Aaron is a pleasure," she affirms. "We think alike and we both come from a background of teamwork, so we get along fabulously." Already they have worked together to participate in increased numbers of standbys, often enlisting the help of other cryonics-support organizations such as Suspended Animation and Critical Care Research. Regina is pleased with such cooperation and says that, under new management, Alcor is now "a much more collaborative, nurturing environment."

Regina loves watching Alcor grow, and says that one of the things she enjoys most is "seeing progress in shades as this place continues to transform." And though she has grown into the role, she looks forward to finding someone to eventually replace her as readiness coordinator so that she can help Alcor transform and grow even more by doing what she does best – getting the message out. A long background in Hollywood colors her vision of what needs to be done. Having seen (and loved) her share of post-apocalyptic movies, Regina is determined to become a harbinger of *good* news for a change. "I want to paint a picture of the future that people can get a grip on," she muses. "A picture of where we can go and what we can be. Not that we will die in an apocalypse, but a bright future for all." ■

You can reach Regina by phone at 480-905-1906 x100 or by email at regina@alcor.org. An in-depth interview with Regina is also available on the cryonics blog Depressed Metabolism at: http://www.depressedmetabolism.com/2008/11/01/interview-with-alcor-readiness-coordinator-regina-pancake/

Scientific Optimism and Progress in Cryonics

By Aschwin de Wolf

> "It is a strange matter of fact that those who watch and admire scientific research from the outside frequently have more confidence in its results than the men who cooperate in its progress"
>
> Hans Reichenbach – The Rise of Scientific Philosophy (1951)

The rationale for cryonics is that illnesses that cannot be cured by contemporary medical technologies might be cured in the future. But behind this rationale two different visions of scientific and technological progress compete for dominance. One perspective can be characterized as "medical conservatism." History has shown that patients who were given up on in the past can be helped today. Although it is not known whether cryonics patients will be cured in the future, it would be prudent to preserve them in as pristine a condition as possible to allow for the possibility of resuscitation in the future.

The other perspective I want to characterize as "scientific meliorism,"[1] or the idea that scientific progress will continue at the same or accelerating pace, or even that anything that is not ruled out by the laws of physics and chemistry *will* happen in the future. Although it is not always possible to draw an exact line between these two concepts, in this brief discussion I will address the limitations and dangers of scientific meliorism for the development of cryonics technologies and safety of our patients.

Scientific meliorism is not hard to recognize in arguments about aging and cryonics. People who share this perspective invariably argue that the developments that will conquer aging and resuscitate cryonics patients are not a matter of "if" but "when." This perspective reveals itself when people are observed asking *when* aging will be conquered or *when* vitrification for whole body patients will become available. It is simply taken for granted that these developments are per definition possible and the only remaining challenges involve adequate fundraising and recruiting competent scientists.

In turn, scientists themselves can share this perspective when they present their work as contributions to the development of technologies that they *know* are possible. For example, when pressed for a timeline, such a scientist will estimate that a certain scientific breakthrough will happen before a specific date. To such a scientist, the question of whether such a milestone is possible at all is not given serious consideration.

In its worst incarnation failure to meet these lofty goals is simply attributed to insufficient fundraising. Of course, if one believes that any scientific or technological challenge can be overcome given enough money one can always blame lack of progress on insufficient resources. But, as should be obvious, in that case claims about insufficient progress can always be blamed on lack of money and statements about estimated breakthroughs become non-falsifiable. A scientist can make himself immune to such attacks by outlining in advance *how much money will be needed to achieve specific breakthroughs within a specific period of time.* This will make the researcher (or fund raiser) more vulnerable to falsification, of course, but also more credible.

The scientific meliorist can employ two kinds of reasoning to support his case. The

[1] I owe the use of the phrase meliorism to characterize the kind of thinking about cryonics that is criticized in this article to Michael Darwin who had independently worked out a number of these themes in his (unpublished) "Meliorism and Cryonics."

most popular is to frame the argument as a form of (naïve) *induction*. The reasoning here is that scientific and technological breakthroughs of the past will continue at the same or an accelerated pace, leading eventually to the development of strong AI, molecular nanotechnology, whole body vitrification, resuscitation of cryonics patients, etc. But as discussed by the 18th century Scottish philosopher David Hume about induction in general, this kind of argument cannot be supported by logic nor empirical observation. There is nothing *necessary* about these developments continuing in such a fashion and observation of contemporary developments do not force us to conclude anything about future developments. In short, claims about future scientific and technological progress cannot be supported by induction and require an element of psychological optimism that is beyond science.

A more abstract argument says that everything that is not ruled out by the laws of physics and chemistry will eventually happen. For simplicity's sake I will ignore non-technological events (such as wars and economic stagnation) that could interfere with such an inevitable course of history in order to focus on the core argument itself. It seems to me that one flaw in this kind of reasoning is that it does not recognize the possibility that something that does not contradict the known laws of physics and chemistry may not be possible within specific configurations of atoms that are required for life.

...something that does not contradict the known laws of physics and chemistry may not be possible within specific configurations of atoms that are required for life.

For example, although nothing in the laws of physics and chemistry rules out the possibility of taking organic matter to cryogenic temperature and back without ice formation and without any adverse effects on viability, *existing human physiology and biochemistry* may not allow it for whole humans. Another example is human aging. Although we could conceive of complex configurations of molecules that do not age, or at least in which aging can be repeatedly reversed if it becomes detrimental, such a prospect may not necessarily apply to human biochemistry as it exists. Again we see that the kind of scientific and technological optimism implicit in this reasoning contains an element of psychological optimism that itself cannot be evaluated by scientific means. On the positive side, the examples used provide something of an "escape-route" because they permit the idea that human physiology itself can be changed through genetic engineering and artificial organ replacement to allow reversible human cryopreservation and effective treatment of aging even if existing human biochemistry does not allow it.

The sort of thinking that I characterized as scientific meliorism is not just an innocent form of extreme optimism about the future. When it comes to dominate our thinking about cryonics it can present a serious threat to the quality of care of cryonics patients because it tends to ignore or downplay the existing challenges of creating a physical infrastructure to support cryonics services and remain vigilant about its persistence. Although this relationship is not necessary, as a general rule, I have observed that people who possess this kind of abstract optimism (abstract because it is based on reasoning, not empirical observation) tend to have little interest in issues such as standby and stabilization, let alone the evaluation of existing cryonics case work. To these people, advances like brain vitrification are merely refinements and good public relations but not perceived as necessary to allow successful resuscitation of cryonics patients.

Scientific meliorism can also (subconsciously) sneak into the way we select and present evidence for the feasibility of cryonics. Instead of establishing what the consensus is on scientific and technical issues pertaining to cryonics, medical journals are being "mined" to find the most cryonics-supportive findings relating to cerebral ischemia and cryopreservation. Of course, in light of the tens of thousands of studies related to these topics it should not be hard to find outliers that justify the most optimistic interpretations about contemporary cryonics procedures. In the past this approach has been followed by Alcor when its promotion materials included incredible case reports from mainstream medicine about resuscitation after extended periods (an hour!) of normothermic cardiac arrest. In contrast, a more conservative and scientifically sound approach would be to defer to scientific and clinical consensus on these topics and determine how credible contemporary cryonics technologies and practices are in light of these findings. It should be stressed that when I speak about scientific consensus I am not suggesting that we should adopt the attitude towards cryonics that is often expressed by "experts" on this topic. In most cases these scientists are not experts on cryonics in any meaningful sense of the word and sometimes are even caught contradicting the scientific consensus *in their own field* in an effort to "debunk" cryonics.

The question we have to face is whether we want to present cryonics as a reasonable expression of medical conservatism that is supported by empirical results and reasonable expectations in cryobiology, resuscitation medicine, and molecular nanotechnology or as an expression of mainly abstract reasoning

Hans Reichenbach (1891–1953) was a logical empiricist philosopher who took great care to distinguish scientific philosophy from wishful thinking.

David Hume (1711-1776) presented one of the most incisive challenges to our habit of using the past to predict the future.

and futurism. The answer to this question is not academic but will have consequences for how we present cryonics, the alliances we attempt to establish, the procedures we adopt, and the importance we assign to ongoing cryonics research. Although advocates of cryonics still encounter a lot of irrational hostility from mainstream scientists and commentators, there are quite a number of opportunities for cryonics organizations to become serious contributors in debates about medicine, emerging technologies, and bioethics.

For example, a growing awareness is emerging in medicine that contemporary criteria for determination of death are becoming more and more controversial. The first major blow to our conception of death was dealt when advances in resuscitation medicine (e.g., CPR, defibrillation) restored life to people that in earlier days would have been given up as dead. A second empirical challenge to our conventional thinking about death was presented when artificial means enabled medicine to keep patients "alive" that are irreversibly brain dead. These developments led to the acceptance of two distinct criteria for determination of death: 'irreversible' cardiopulmonary arrest and brain death. But the co-existence of these two criteria should become a transient thing if we develop the means to preserve the viability of the brain, or at least prevent the neurological injury that normally precedes the diagnoses of brain death, through the use of low subzero temperatures.

Although the idea of information-theoretic death is useful, and a deeply ethical concept that justifies the decision not to give up too easily on a person that is considered dead by contemporary criteria, advocates of human cryopreservation do not need to embrace this alternative definition of death to make a persuasive case for its broader acceptance. Even the contemporary definition of brain death presents an opportunity to present empirical evidence that we may be able to avert the development of this fate in persons who cannot be salvaged by cardiopulmonary criteria.

This article started by contrasting medical conservatism with scientific meliorism and presented a critique of some of the assumptions that are implied in the latter perspective. In short, we may not realize how (dangerously) optimistic we are, especially as far as the *practice* of cryonics is concerned. But I want to conclude the article by pointing out that we may not realize how persuasive our position could be if we would simply stick to the cryobiological evidence that has been generated to date and its implications for contemporary debates on the definition of death. We should not expect that others will point to the implications of research that demonstrates that brain tissue can be reversibly vitrified with maintenance of electrical activity. There is an urgent need to make clear that cardiopulmonary death no longer requires us to accept that brain death will inevitably follow. We need to move beyond arguing about probabilities and the laws of chemistry and physics and point out that even existing medical practice mandates a closer look at cryonics in light of its own criteria for determination of death.

So what do I recommend? I suggest that we recognize our (excessive) optimism about the future of science and technology and focus on what technical advances can be made right now to give cryonics a serious place at the table. If we support research to demonstrate that recovery of electrocerebral activity in vitrified whole brains is possible and insist on its dissemination to science writers and the general public we can start arguing that under ideal circumstances cryonics patients will meet the minimum medico-legal test of being alive. I further suggest that we re-direct some of our futurist interests to more tangible matters such as the legal, financial, and technical stability of cryonics organizations. We should be prepared to sacrifice some of our excessive optimism for a dose of healthy realism and anxiety. On the positive side, such a shift in focus will improve our chances of survival. ■

We need to move beyond arguing about probabilities and the laws of chemistry and physics and point out that even existing medical practice mandates a closer look at cryonics in light of its own criteria for determination of death.

Recommended Reading

Leslie Whetstine, Stephen Streat, Mike Darwin and David Crippen – *Pro/con Ethics Debate: When is Dead Really Dead?* Critical Care 9:538-542, 2005

Yuri Pichugin, Gregory M. Fahy, and Robert Morin – *Cryopreservation of rat hippocampal slices by vitrification.* Cryobiology 52: 228–240, 2006

Leslie Whetstine – *An Examination of the Bio-Philosophical Literature on the Definition and Criteria of Death: When is Dead Dead and Why Some Donation After Cardiac Death Donors Are Not.* Ph.D. Dissertation, Duquesne University, 2006

David Crippen and Leslie Whetstine: *Ethics Review: Dark Angels – The Problem of Death in Intensive care.* Critical Care, 11(1):202, 2007

THE GOLDILOCKS ENIGMA:
WHY IS THE UNIVERSE JUST RIGHT FOR LIFE?

Author: Paul Davies *(London: Penguin Books, 2007.)*

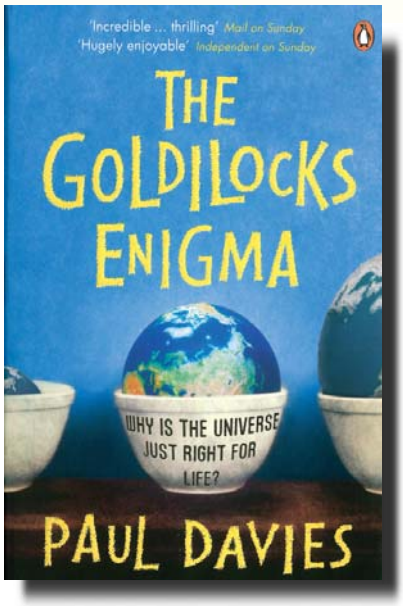
BOOK REVIEW BY R. MICHAEL PERRY, PH.D.

Why is the universe just right for life? Was it intelligently designed or just "thrown together" by accident? Or is it the only possible universe? More generally, what is the nature of reality as a whole? What is it that exists, and why does it exist rather than something else? What is the proper role of intelligent life in the scheme of things? These questions have vexed humanity through the ages, and opinions about them deeply affect us today. As one case in point, we as immortalists are trying to find ways to radically extend the length of our lives and perhaps transcend the very sort of creatures we are. Our goal is controversial in part because of attitudes people have on the above questions, which to them raise further questions. Is it right to attempt what we are trying to do? Is it feasible? Is it worthwhile? Modern cosmology, while not directly addressing these latter issues, does offer some new background insights, as physicist and popular author Paul Davies tells us in *The Goldilocks Enigma*.

Actually, we need to first ask whether there really is an "enigma," given, for instance, that Darwin's theory of evolution seems to account for the various species we find on planet Earth. Life is certainly remarkable in our solar system, where an earthlike environment occurs only once. But is it so remarkable in the whole universe, with all the possibilities that must exist out there, extrasolar planets in particular? Opinion on this subject is divided, and Davies does not address it in his book. However, the universe as a whole seems a very odd place for the fact that life as we know it is possible. Carbon chemistry is essential, for instance; no other element will do, but along with carbon and its many compounds go water and a host of other chemical species. Davies remarks, "If almost any of the basic features of the universe, from the properties of atoms to the distribution of the galaxies, were different, life would very probably be impossible." So we really have an oddball universe by appearances, an impression that recent discoveries such as cosmic acceleration have not dispelled but if anything reinforced, and we must then ask what is the explanation.

Davies offers a broad range of views on why it happens that the universe supports life, before considering his personal preferences. Among the views with broad-based support, whether from scientists or the public at large, are that this is the only possible universe, and the strangely coincident, life-supporting properties will in time be explained from basic physics. A second, ever-popular alternative is intelligent design: some form of God or higher power chose the features we see. (This includes the possibility that we are in a computer-like simulation run by some advanced civilization. In that case the physics we pursue is make-believe, created by whomever programmed the system, a prospect Davies finds disturbing.) A third possibility concedes the existence of multiple universes on a more-or-less equal footing, which could vary greatly in their properties. Ours is right for us, not by any intelligent design or physical inevitability but by anthropic selection: life can only be found in those universes able to support it. Such "lucky" universes may actually be only a small part of the whole, much as a winning lottery ticket is rare. A fourth possibility is not hostile to the idea of multiple universes but holds that a universe to exist must be able to give rise to life.

Davies makes it clear that he is personally inclined toward the fourth possibility, suggesting that "only self-consistent loops

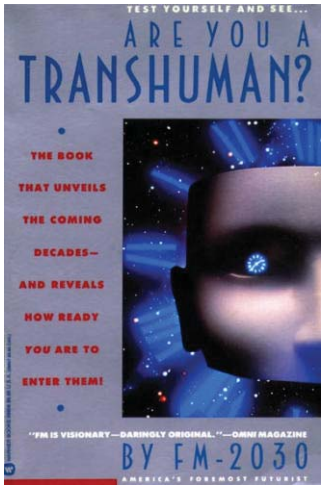


capable of understanding themselves can create themselves, so that only universes with (at least the potential for) life and mind really exist." This position is not held dogmatically, and the strengths and weaknesses of all the different views are explored at length. To me it seemed nevertheless that, if the presence of multiple universes is accepted (and it seems reasonable), the case for the existence of only those with life-potential was rather weak. The book in any case is an exciting romp through some of the recent findings of cosmology. There is intriguing speculation about our place within reality as a whole, with an optimistic conclusion: we and life in general are important, at least collectively. Davies does not appear to be an immortalist, however, and there is no mention of the prospect that developing technologies, including cryonics, could make it possible for you and me, as individuals, to live much longer and learn much more. ■

"It Was Twenty Years Ago Today"

By Alan Brooks

Twenty years ago, FM-2030, who had long before changed his surname from Esfandiary, published a book, *Are You A Transhuman?* (AYAT). FM saw before almost anyone that transhumans are here and now. Every time someone has an artificial organ placed in their body a transhuman is created. FM understood that anyone who wants to can be transhuman. Surgeries once projected are now routine. Merely helping the elderly to live longer lives is unwittingly contributing to transhumanism (h+).

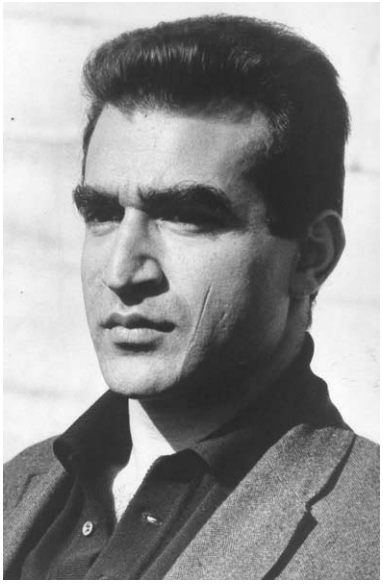


However, FM was a mediocre futurist. Perhaps the worst fault line running through AYAT is a subtle Jane Fonda Workout Video syndrome: if people eat well and work out regularly they will be better, more aware, more socially conscious citizens.

Not necessarily.

For with proper diet, good sleep habits, supplementation, medical care, and of course h+, criminals can live indefinitely and now criminals can routinely commit crimes with computers. For example, they can access bank accounts other than their own because a free society cannot do all that much to prevent crime without infringing the liberties of law abiding citizens. Despite some grounding in psychobiology, FM ignored the genetic bases of criminality. Correcting criminals fails because criminals learn to mask their behavior, and how can a truly free society force criminals to change? Criminals think they run businesses.

AYAT is largely in the form of questions yet they are actually statements. For instance: "are you an ageist?" Did he mean, do people prefer prettiness to old and wrinkled? FM ought to have been more specific. Worse, though he pretended to be "suggestive, not conclusive," his AYAT questions weren't merely statements, they were edicts, the most bizarre in AYAT being "if you think you are a realist, you are... full of jet exhaust." He predicted a "hyperfluid world" but wrote, again rather bizarrely, of how many people "are not promiscuous, they are fluid." This was his Persian patrimony talking for him, rationalizing polygamy (such 'liberation' benefits mostly men). FM felt validated when the swinging sixties hit its stride and he could rationalize such "fluidity" as much as any Oriental haremkeeper. Cavalier in regards to the future of the nuclear family, he wrote and taught in lectures about what he referred to as "collaborative parenting," influenced as much as anything by Persian polygamy and his experiences in having been moved from one location to another all



FM-2030

around the world. As many radical progressives, he couldn't understand that the material progress he appreciated can't fix broken families or somehow, as if by magic, replace the nuclear family institution. This was pure hubris on his part, tunnel vision.

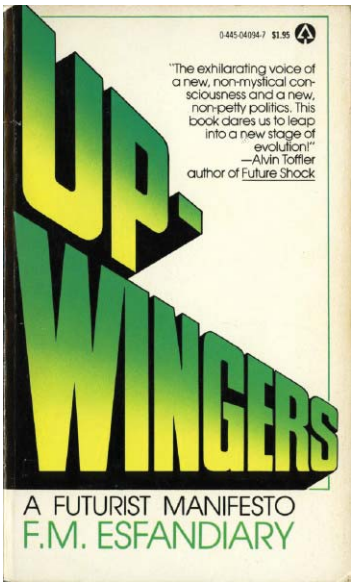
FM's books were carefully attuned to appeal to those considering longer lives (or existences) for themselves. It's just too bad his prediction of a superabundant world by 2030 is wildly optimistic. And not just this world but also other worlds, for FM predicted space will be colonized by 2030, which is patently absurd. Likely 'we' will live in a world of numerous transhumans by 2030 but we will not "link in and out of orbits." This is where conservatism comes in handy, i.e. making conservative estimates.

Saying "space can be colonized generations from now" is a conceivable, even plausible, prediction; saying we will be "linking in and out of orbits in 2030" is Space Age hogwash. No matter how well intentioned it may be, it is no improvement on Timothy Leary's over-the-top predictions from that silly season of hype, the 1960s.

In his Disney-meets-Brave-New-World article 'Upwing Priorities,' written roughly three decades ago, FM predicted a nonpossessive humanity by 2010, a prediction prompting one to wonder what FM was smoking in the 1970s, for by the late 1970s/early '80s it became obvious such a notion is a Marxist mirage. People live in large dwellings not merely to have space to spread out in but also to keep their possessions stored, much of what they possess being little or no more than junk. FM told me he favored socialism over capitalism; however, it would appear scarcity would first have to be terminated, as prices are fixed in socialism, and socialist government attempts to intrude into all facets of life, or, again, existence. FM called himself an "Upwinger," but he was, simply put, far too vague to be called anything other than a transhumanist (and, after further consideration, a transhuman).

FM may even have been born naive. Who knows? Yet still, to his credit, FM did understand that "probably everyone is attracted to power." Echoing the precise words of his colleague Alvin Toffler, FM wrote: "it's not that they don't try [to grasp power]." Toffler, with uncharacteristic foresight, predicted: "little Hitlers and Stalins will come out of the woodwork," asking us to relinquish our freedoms.

So even mediocre seers can sometimes make good predictions, like a prospector digging up tons of dirt to once in a while find tiny flecks of gold. Understandably, FM held on to the idealistic dreams of his youth. However, he disregarded his own advice to "jettison" outmoded sentiments, for FM rehashed his social theories in lecture after lecture, article after article, book after book, never outgrowing his origins as a 1950s progressive and '60s futurist, so predictably his grandiosity got the better of him; around three decades ago in response to a query concerning the status of women in the year 2000 he condescendingly prattled, "I immediately thought [women will be equal to men]." He ought to have thought some more because the principal difference between men and women is that men are willing to use force and women can only manipulate, so women can't be "equal" to men, even if they do attain nominal positions in charge; real power flows from force. FM had a resulting essay, 'Woman 2000,' published; it is more embarrassing, if possible, than 'Upwing Priorities.' His best work might have been his first book, *Optimism One*, which as its title could imply, avoided the over-leaping, rather baseless, optimism of his later efforts.



FM's theories have shown me what to avoid, have demonstrated only the near future is of interest, the far future is of interest only to superwonks – futurists go where fools fear to tread. You can't even really predict the near future, only change things and if such works out to your specifications then the near future is yours, it belongs to you, you win and someone else's vision of the future loses out.

After knowing FM for eight years starting in 1992 (he was cryopreserved in 2000) and reading a great deal of what he wrote, I would say he was an original transhumanist but a greatly deluded futurist, which is saying a great deal. His coming from a family employed by the technocratic – and last – Shah of Iran may have had something to do with FM's Brave New World impulses. The long and short of it is FM tried too hard to bury his past and became a stranger to himself. ■

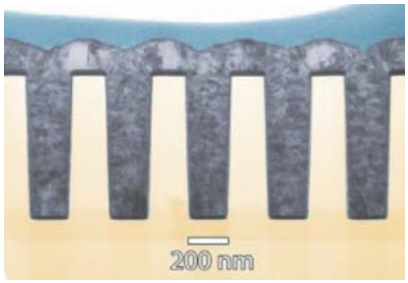
Alan Brooks

Alan Brooks, born in 1956, joined Alcor in 2002 for reasons he cannot entirely recall. Freelance writer and real estate dabbler who loses more money than he makes. Slightly interested in science, Brooks' motto is 'every action results in an equal and opposite over-reaction.'

New 3-D Nanofabrication Technique for Magnetic Materials

Materials scientists at the National Institute of Standards and Technology have developed a process to build complex, three-dimensional nanoscale structures of magnetic materials such as nickel or nickel-iron alloys using techniques compatible with standard semiconductor manufacturing. The process, described in a recent paper, could enable whole new classes of sensors and microelectromechanical (MEMS) devices. The NIST team also demonstrated that key process variables are linked to relatively quick and inexpensive electrochemical measurements, pointing the way to a fast and efficient way to optimize the process for new materials. The NIST process is a variation of a technique called "Damascene metallization" that often is used to create complicated three-dimensional copper interconnections, the "wiring" that links circuit elements across multiple layers in advanced, large-scale integrated circuits. Journal reference: C.H. Lee, J.E. Bonevich, J.E. Davies and T.P. Moffat. Magnetic materials for three-dimensional Damascene metallization: void-free electrodeposition of Ni and Ni70Fe30 using 2-mercapto-5-benzimidazolesulfonic acid. Journal of The Electrochemical Society, 155 (7) D499-D507 (2008).

ScienceDaily
6/30/08
http://www.sciencedaily.com/releases/2008/06/080627163233.htm



Working in the trenches: Transmission electron microscopy image of a thin cross section of 160 nanometer trenches shows deposited nickel completely filling the features without voids. (Color added for clarity.) (Credit: NIST)

Sulston Argues for Open Medicine

Britain's Sir John Sulston says that profits are taking precedence over the needs of patients, particularly in the developing world. He was speaking at the launch of a new research institute into science, ethics and innovation. Sir John shared the 2002 Nobel Prize for medicine for his work on the genetics controlling cell division. He is well known for his commitment to public medicine and his opposition to the privatization of scientific information. Eight years ago he led the fight to keep the data being derived from the Human Genome Project open and free to any scientist who wanted to use it. He says there is now great concern among researchers about private companies patenting genes and genetic tests. He is also concerned about the misuse of information, and what he terms "disease mongering." Sir John is to be the chairman of a new UK-based institute that will research the ethical questions raised by science and innovation.

BBC News
7/4/08
http://news.bbc.co.uk/2/hi/science/nature/7490384.stm

New Evidence Calorie Restriction May Slow Human Aging

Calorie restriction has long been shown to slow the aging process in rats and mice. While scientists do not know how calorie restriction affects the aging process in rodents, one popular hypothesis is that it slows aging by decreasing a thyroid hormone, triiodothyronine (T3), which then slows metabolism and tissue aging. A new study in the June 2008 issue of Rejuvenation Research, found that calorie restriction—cutting approximately 300 to 500 calories per day—had a similar biological effect in humans and, therefore, may slow the aging process. "Over recent years, there has been a huge amount of debate about whether calorie restriction slows the aging process in humans," said Edward Weiss, Ph.D., associate professor of nutrition and dietetics at Saint Louis University's Doisy College of Health Sciences and lead author of the study. "Our research provides evidence that calorie restriction does work in humans like it has been shown to work in animals. The next step is to determine if this in fact slows age-related tissue deterioration. The only way to be certain, though, is to do a long-term study."

ScienceDaily
7/6/08
http://www.sciencedaily.com/releases/2008/07/080703113652.htm

Babies from Frozen Embryos Just As Healthy

More evidence is emerging that babies conceived in test tubes might be just as healthy as those conceived naturally, researchers said July 8. Two studies presented at a meeting of the European Society of Human Reproduction and Embryology found that in-vitro fertilization and the freezing of embryos did not significantly increase the babies' chances of medical problems. "These procedures are relatively safe and patients shouldn't be overly concerned," said Dr. Christopher Barratt, a professor of reproductive medicine at the University of Dundee in Britain.

MSNBC
7/8/08
http://www.msnbc.msn.com/id/25590308/

Solar Dyes Give a Guiding Light

Current solar plants need large mobile mirrors to produce energy. A new way of capturing the energy from the Sun could increase the power generated by solar panels tenfold, a team of American scientists has shown. The new technique involves coating glass with a

specific mixture of transparent dyes which redirect light to photovoltaic cells in the frame. The technology, outlined in the journal Science, could be used to convert glass buildings into vast energy plants. The technology could be in production within three years, the team said. "It makes sense to coat the side of [very tall] buildings with these new panes," Professor Marc Baldo, one of the researchers on the team, told BBC News. "It's not far fetched at all."

BBC News
7/11/08
http://news.bbc.co.uk/2/hi/technology/7501476.stm

Technology and the Aspiring Methuselahs

More than 200 scientists and longevity activists gathered at UCLA recently to discuss advancements in repairing humans. New technology is making it possible to imagine a world with ever greater life spans, but old world issues pervaded the discussions. The Methuselah Foundation's Aubrey de Grey organized the event and kicked it off with a theoretical explanation of how human aging might be reversed in the future. He argues that there are seven kinds of damage in human cells, and his mission is to get scientists all over the world involved in creating the fixes. The reason to focus on aging is not some vain plan to look years younger. Instead, it turns out that aging is a significant risk factor in all the major diseases that the American population faces such as cancer, heart disease, Alzheimer's and Type 2 diabetes. The opening panel featured well-known and respected scientists such as Berkeley professor Bruce Ames, father of the Ames test for carcinogens, and professor William Haseltine, who coined the term "regenerative medicine." However, instead of talking medicine, the discussion focused on one of the oldest complaints in science: how to get money for funding.

TechNewsWorld
7/11/08
http://www.technewsworld.com/story/63748.html

Quantum Leap

An international team of researchers has shown that it can control the quantum state of a single electron in a silicon transistor—even putting the electron in two places at once. Their discovery could help pave the way toward a practical quantum computer. Quantum computers take advantage of the strange properties of subatomic particles to perform certain types of calculations much faster than classical computers can. Researchers are exploring a host of different approaches to quantum computing, and some have even built primitive quantum circuits that can perform calculations. But practical quantum computing would require the ability to manufacture devices with millions of quantum circuits—rather than the 12 or 16 achievable now—that can be integrated with more-conventional electronics. One theoretical approach to practical quantum electronics is to use conventional electronics—tiny semiconductor transistors—to control the state of a quantum system. Researchers led by Sven Rogge, a researcher at Delft University of Technology, in the Netherlands, performed the first practical experiments to verify the approach's theoretical predictions.

Technology Review (MIT)
7/17/08
http://www.technologyreview.com/Infotech/21086/?a=f

Prevailing Theory of Aging Challenged in Stanford Worm Study

Age may not be rust after all. Specific genetic instructions drive aging in worms, report researchers at the Stanford University School of Medicine. Their discovery contradicts the prevailing theory that aging is a buildup of tissue damage akin to rust, and implies science might eventually halt or even reverse the ravages of age. "We were really surprised," said Stuart Kim, PhD, professor of developmental biology and of genetics, who is the senior author of the research. Kim's lab examined the regulation of aging in C. elegans, a millimeter-long nematode worm whose simple body and small number of genes make it a useful tool for biologists. The worms age rapidly: their maximum life span is about two weeks. Comparing young worms to old worms, Kim's team discovered age-related shifts in levels of three transcription factors, the molecular switches that turn genes on and off. These shifts trigger genetic pathways that transform young worms into geezers. The findings will appear in the July 24 issue of the journal Cell.

Physorg.com
7/24/08
http://www.physorg.com/news136125084.html

Alzheimer's Drug "Halts" Decline

UK scientists have developed a drug which may halt the progression of Alzheimer's disease. Trials of the drug, known as Rember, in 321 patients showed an 81% difference in rate of mental decline compared with those not taking the treatment. The Aberdeen University researchers said the drug targeted the build-up of a specific protein in the brain. Alzheimer's experts were optimistic about the results, but said larger trials were now needed. Presenting the results at the International Conference on Alzheimer's Disease, Professor Claude Wischik said the drug may be on the market by 2012. Patients with mild to moderate Alzheimer's disease were given either 30, 60 or 100mg of the drug or a placebo. The 60mg dose produced the most pronounced effect—over 50 weeks there was a seven-point difference on a scale used to measure severity of dementia. At 19 months there was no significant decline in mental function in patients taking the drug, the researchers said. Imaging data also suggests the drug may be having its biggest effect in the parts of the brain responsible for memory.

BBC News
7/29/08
http://news.bbc.co.uk/2/hi/health/7525115.stm

The Brain Unmasked

The typical brain scan shows a muted gray rendering of the brain, easily distinguished by a series of convoluted folds. But according to

Van Wedeen, a neuroscientist at Massachusetts General Hospital, in Boston, that image is just a shadow of the real brain. The actual structure--a precisely organized tangle of nerve cells and the long projections that connect them--has remained hidden until relatively recently. Diffusion spectrum imaging (DSI) is a new technique that uses magnetic resonance imaging of the brain to track the movement of water molecules along the neural wires or axons. In this way the axons themselves can be mapped to create a detailed blueprint of the brain's connectivity. On the medical side, radiologists are beginning to use the technology to map the brain prior to surgery, for example, to avoid important fiber tracts when removing a brain tumor. Wedeen and others are now using diffusion imaging to better understand the structures that underlie our ability to see, to speak, and to remember. Scientists also hope that the technique and others will grant new insight into diseases linked to abnormal wiring, such as schizophrenia and autism.

Technology Review (MIT)
8/6/08
http://www.technologyreview.com/Biotech/21175/

Cell Change "Keeps Organs Young"

Researchers may have found a way to halt the biological clock which slows down our bodies over the decades. A US team thinks it may have found the genetic levers to help boost a system vital to cleaning up faulty proteins within our cells. The journal Nature Medicine reported that the livers of genetically-altered older mice worked as well as those in younger animals. These results show it's possible to correct this protein "logjam" that occurs in our cells as we get older. The researchers, from Yeshiva University in New York, are focusing on a process which is central to the proper working of cells. The fundamental chemicals of cells—proteins—often have very short working lives, and need to be cleared away and recycled as soon as possible. The body has a system for doing just that, but it becomes progressively less efficient as we get older. This leads to progressive falls in the function of major organs—the heart, liver and brain. Dr. Ana Maria Cuervo, from Yeshiva, created a mouse with two genetic alterations. The first, when activated, boosted the number of specific cell receptors linked to this protein recycling function, while the second allowed the first to be turned on whenever Dr. Cuervo wished simply by modifying the animal's diet.

BBC News
8/10/08
http://news.bbc.co.uk/2/hi/health/7548874.stm

Aussies Crack Cancer Secret

Australian scientists are hoping to cure leukemia, asthma and rheumatoid arthritis after their breakthrough discovery of how to stop killer blood cells growing. The team has unlocked the secrets behind the protein which controls the way the blood cancer cells spread when it is damaged—and have found a way to stop its deadly process. Work is now starting to design a drug to prevent the damaged proteins operating, effectively stopping the cancer as well as asthma and inflammatory diseases such as rheumatoid arthritis. After spending a decade uncovering the structure of the receptor protein, which sits on the surface of white blood cells, lead researcher Professor Michael Parker, of Melbourne's St Vincent's Institute, said scientists could now build a drug to attach itself to the protein and stop it sending messages into the cells telling them to multiply unchecked. "If we can stop the signal for the proliferation of uncontrolled growth of the cells then we can stop the leukemia in its tracks," he said.

The Daily Telegraph
8/11/08
http://www.news.com.au/dailytelegraph/story/0,22049,24157781-5005941,00.html

Diamond Mechanosynthesis Experiments to Start

Professor Philip Moriarty of the Nanoscience Group in the School of Physics at the University of Nottingham (U.K.) has been awarded a five-year £1.67M ($3.3M) grant by the U.K. Engineering and Physical Sciences Research Council (EPSRC) to perform a series of laboratory experiments designed to investigate the possibility of diamond mechanosynthesis (DMS). DMS is a proposed method for building diamond nanostructures, atom by atom, using the techniques of scanning probe microscopy under ultra-high vacuum conditions. Moriarty's project, titled "Digital Matter? Towards Mechanised Mechanosynthesis," was funded under the Leadership Fellowship program of EPSRC. Moriarty's experiments begin in October 2008. The Nottingham work grew out of continuing discussions on DMS between Moriarty and Robert Freitas, a Senior Research Fellow at the Institute for Molecular Manufacturing (IMM) (Palo Alto, California, U.S.). Freitas and Ralph Merkle, also a Senior Fellow at IMM, founded the Nanofactory Collaboration in 2001 to pursue molecular manufacturing via DMS. Since then they have produced a series of papers.

IMM Research Fellow (and Alcor Director) Ralph Merkle

Nanofactory Press Release
8/10/08
http://www.molecularassembler.com/Nanofactory/Media/PressReleaseAug08.htm

Lensless Astronomical Imaging System with Military Applications

Defense firm Qinetiq has brought the technology down to Earth to make a monitoring system that may be able to track thousands of targets. Hardware with these abilities would be helpful for peace-keeping forces who want to wind images back from an incident, such as a car bomb exploding, to gather useful intelligence about where the vehicle began its journey. The futuristic system manages the feat without using lenses to gather light from the scene it is watching. Instead it employs a sensor array,

a special "mask" with randomly distributed holes (or pinholes) passing through it, and image processing software to picture a scene. Astronomers had been attracted to such devices because they coped much better with conditions in space, said Dr Chris Slinger, Qinetiq's principal investigator on the system. Nasa used such an approach, called coded aperture imaging, for the Swift satellite that was sent aloft to spot gamma ray sources.

BBC News
8/12/08
http://news.bbc.co.uk/2/hi/technology/7553622.stm

This coded aperture helps Swift spot gamma ray bursts —NASA photo.

Fast Quantum Computer Building Block Created

The fastest quantum computer bit that exploits the main advantage of the qubit over the conventional bit has been demonstrated by researchers at University of Michigan, U.S. Naval Research Laboratory and the University of California at San Diego. The scientists used lasers to create an initialized quantum state of this solid-state qubit at rates of about a gigahertz, or a billion times per second. They can also use lasers to achieve fundamental steps toward programming it. A conventional bit can be a 0 or a 1. A quantum bit, or qubit, can be both at the same time. Until now, scientists couldn't stabilize that duality. Physics professor Duncan Steel, doctoral student Xiaodong Xu and their colleagues used lasers to coherently, or stably, trap the spin of one electron confined in a single semiconductor quantum dot. A quantum dot is like a transistor in a conventional computer. The scientists trapped the spin in a dark state in which they can arbitrarily adjust the amount of 0 and 1 the qubit represents. They call this state "dark" because it does not absorb light. Therefore, light does not cause loss of coherence between the two states. In other words, the light does not destabilize the qubit. A paper on these findings will be published in Nature Physics.

E! Science News
8/20/08
http://esciencenews.com/articles/2008/08/20/fast.quantum.computer.building.block.created

Hopes Raised for Block on Cancer

Scientists say they have taken a big step towards blocking a chemical vital to the growth of many cancers. They have unpicked the structure of telomerase, an enzyme which, when active, helps keep cells in an "immortal" state. The chemical is at work in more than nine out of ten types of tumor. Researchers from Philadelphia's Wistar Institute, writing in the journal Nature, say their efforts could lead to drugs which switch it off. The idea is that you could convert immortal cancer cells back into mortal ones by blocking telomerase in this way. The Wistar team has found a new way to map the structure of the most active part of the chemical. Dr Emmanuel Skordalakes said that this detailed picture would help provide molecular targets for drugs. "Telomerase is an ideal target for chemotherapy because it is active in almost all human tumors, but inactive in most normal cells. That means that a drug that deactivates telomerase would likely work against all cancers, with few side effects."

BBC News
8/31/08
http://news.bbc.co.uk/2/hi/health/7588060.stm

Fusion Power Seeks Super Steels

Scientists say an understanding of how the Twin Towers collapsed will help them develop the materials needed to build fusion reactors. New research shows how steel will fail at high temperatures because of the magnetic properties of the metal. The New York buildings fell when their steel backbones lost strength in the fires that followed the plane impacts. Dr Sergei Dudarev told the British Association Science Festival that improved steels were now being sought. The principal scientist at the United Kingdom Atomic Energy Authority (UKAEA) said one of the first applications for these better performing metals would be in the wall linings of fusion reactors where temperatures would be in a similar range to those experienced in the Twin Towers' fires. The key advance is the understanding that, at high temperatures, tiny irregularities in a steel's structure can disrupt its internal magnetic fields, making the rigid metal soft.

BBC News
9/10/08
http://news.bbc.co.uk/2/hi/science/nature/7607473.stm

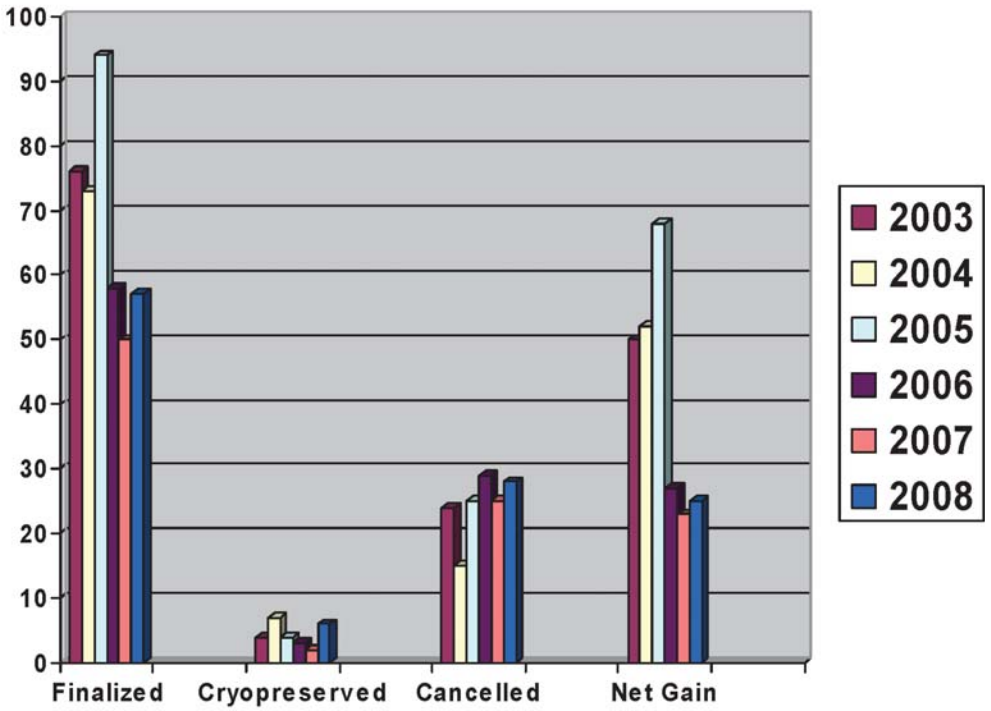
Important Twist in Supercapacitor Research

Car batteries as we know them today may soon be relics. Storing energy in clunky containers with limited shelf lives has plagued car makers and military engineers who need lightweight, powerful and reliable means to crank engines into life, enliven radios and operate other electronic appliances. Now research by post-doctoral Researcher Jiyoung Oh and Research Scientist Mikhail "Mike" Kozlov at UT Dallas' NanoTech Institute offers tantalizing insights into a new, lightweight, reliable means of delivering power via the mighty supercapacitor. A photograph of a material obtained in their research made the cover of the journal Synthetic Metals along with the published paper, (Synthetic Metals, 158 (2008) 638). Supercapacitors are beefed-up electronic components that can be charged and counted on to store energy reliably for long periods. They deliver power in a smooth, steady stream safe for operating sensitive electronics. Unlike car lead batteries, which are typically heavier and bulkier, capacitors and super-capacitors accumulate electric charge instead of delivering it via a chemical reaction.

Physorg.com
9/19/08
http://www.physorg.com/news141048611.html

Membership Report

On September 30, 2008, Alcor had 863 members on its Emergency Responsibility List. In the past nine months, there have been 57 membership approvals, 2 membership reinstatements, 28 cancellations, and 6 cryopreservations, producing a net gain of 25 members for 2008 to date.



Alcor Throughout The World

COUNTRY	MEMBERS	APPLICANTS	PATIENTS	SUBSCRIBERS
Argentina	0	0	0	1
Australia	10	1	2	8
Austria	0	0	0	1
Canada	36	3	2	19
France	0	0	0	1
Germany	3	0	0	2
Greece	1	0	0	0
Israel	0	0	1	0
Italy	1	0	0	3
Luxembourg	1	0	0	0
Mexico	2	0	0	0
Monaco	2	0	0	0
Netherlands	3	1	0	1
Portugal	2	0	0	0
Spain	2	0	0	0
Sweden	0	0	0	2
Switzerland	0	0	0	1
Thailand	2	2	0	1
U.K.	22	4	1	12
USA	776	51	78	385
Totals	**863**	**62**	**84**	**437**

MEETINGS

About the Alcor Foundation

The Alcor Life Extension Foundation is a nonprofit tax-exempt scientific and educational organization dedicated to advancing the science of cryopreservation and promoting it as a rational option. Being an Alcor member means knowing that—should the worst happen—Alcor's Emergency Response Team is ready to respond for you, 24 hours a day, 365 days a year.

Alcor's Emergency Response capability includes specially trained technicians and customized equipment in Arizona, northern California, southern California, and south Florida, as well as many additional certified technicians on-call around the United States. Alcor's Arizona facility includes a full-time staff, and the Patient Care Bay is personally monitored 24 hours a day.

ARIZONA

Scottsdale:
This group meets the third Friday of each month and gatherings are hosted by Alcor employee Regina Pancake. To RSVP, visit http://cryonics.meetup.com/45/ or email regina@alcor.org.

At Alcor:
Alcor Board of Directors Meetings and Facility Tours – Alcor business meetings are generally held on the first Saturday of every month starting at 11:00 am MST. Guests are welcome. Facility tours are held every Tuesday and Friday at 2:00 pm. For more information or to schedule a tour, call D'Bora Tarrant at (877) 462-5267 x 101 or email dbora@alcor.org.

CALIFORNIA

Los Angeles:
Alcor Southern California Meetings—For information, call Peter Voss at (310) 822-4533 or e-mail him at peter@optimal.org. Although monthly meetings are not held regularly, you can meet Los Angeles Alcor members by contacting Peter.

San Francisco Bay:
Alcor Northern California Meetings are held quarterly in January, April, July, and October. A CryoFeast is held once a year. For information on Northern California meetings, call Marek (Mark) Galecki at (408)245-4928 or email Mark_galeck@pacbell.net.

DISTRICT OF COLUMBIA

Life Extension Society, Inc. is a cryonics and life extension group with members from Washington, D.C., Virginia, and Maryland. Meetings are held monthly. Contact Secretary Keith Lynch at kfl@keithlynch.net. For information on LES, see our web site at www.keithlynch.net/les

MASSACHUSETTS

Boston:
A cryonics discussion group meets the second Sunday of each month. For more information, contact David Greenstein at (508) 879-3234, e-mail: davegre2000@yahoo.com.

TEXAS

Dallas:
North Texas Cryonauts, please sign up for our announcements list for meetings (http://groups.yahoo.com/group/cryonauts-announce) or contact David Wallace Croft at (214) 636-3790 for details of upcoming meetings.

NEVADA

Las Vegas:
There are many Alcor members in the Las Vegas area. If you wish to meet and socialize, contact Katie Kars at (702) 251-1975. This group wants to get to know you!

WASHINGTON

Seattle:
For information on Northwest meetings, call Richard Gillman at (425) 641-5136 or join the e-mail group CryonicsNW at http://groups.yahoo.com/group/CryonicsNW

UNITED KINGDOM

There is an Alcor chapter in England. Its members are working diligently to build solid emergency response, transport, and cryopreservation capability. For information about meetings, contact Alan Sinclair at cryoservices@yahoo.co.uk. See the web site at www.alcor-uk.org.

Host a Meeting in your area.

If you are interested in hosting regular meetings in your area, contact Alcor at 877-462-5267 ext. 113. Meetings are a great way to learn about cryonics, meet others with similar interests, and introduce your friends and family to Alcor members!

NEW ENGLAND

A New England area group meets regularly. For meeting dates and to be included in the group email list please contact either David Greenstein at 508-879-3234 or davegre2000@yahoo.com or Bret Kulakovich at 508-946-4626 (8am-8pm EST) or alcor@bonfireproductions.com.

WHAT IS CRYONICS?

Cryonics is an attempt to preserve and protect the gift of human life, not reverse death. It is the speculative practice of using extreme cold to preserve the life of a person who can no longer be supported by today's medicine. Will future medicine, including mature nanotechnology, have the ability to heal at the cellular and molecular levels? Can cryonics successfully carry the cryopreserved person forward through time, for however many decades or centuries might be necessary, until the cryopreservation process can be reversed and the person restored to full health? While cryonics may sound like science fiction, there is a basis for it in real science. The complete scientific story of cryonics is seldom told in media reports, leaving cryonics widely misunderstood. We invite you to reach your own conclusions.

HOW DO I FIND OUT MORE?

The Alcor Life Extension Foundation is the world leader in cryonics research and technology. Alcor is a non-profit organization located in Scottsdale, Arizona, founded in 1972. Our website is one of the best sources of detailed introductory information about Alcor and cryopreservation (www.alcor.org). We also invite you to request our **FREE** information package on the "Free Information" section of our website. It includes:

- A 30-minute DVD documentary "The Limitless Future"
- A fully illustrated color brochure
- A sample of our magazine
- An application for membership and brochure explaining how to join
- And more!

Your free package should arrive in 1-2 weeks.

(The complete package will be sent free in the U.S., Canada, and the United Kingdom.)

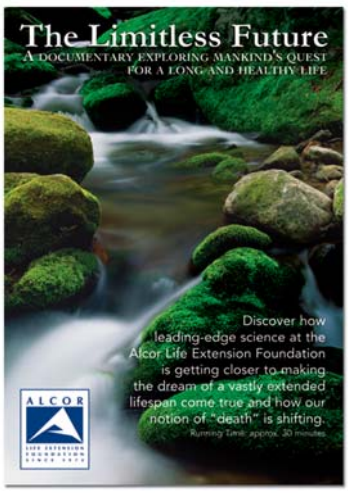
HOW DO I ENROLL?

Signing up for a cryopreservation is easy!

Step 1: Fill out an application and submit it with your $150 application fee.
Step 2: You will then be sent a set of contracts to review and sign.
Step 3: Fund your cryopreservation. While most people use life insurance to fund their cryopreservation, other forms of prepayment are also accepted. Alcor's Membership Coordinator can provide you with a list of insurance agents familiar with satisfying Alcor's current funding requirements.
Finally: After enrolling, you will wear emergency alert tags or carry a special card in your wallet. This is your confirmation that Alcor will respond immediately to an emergency call on your behalf.

Call toll-free today to start your application:
877-462-5267 ext. 132
info@alcor.org
www.alcor.org

ALCOR
LIFE EXTENSION FOUNDATION
SINCE 1972



The Limitless Future
Get your FREE copy of Alcor's 30-minute DVD documentary by visiting the "Free Information" section of our website

Will You Be Alive and Healthy

10...20...30 Years from now?

Your best chance at achieving future immortality is to protect your precious health now so you can benefit from future medical breakthroughs. Staying informed about the latest health discoveries can mean the difference between life and premature death.

And the **Life Extension Foundation** can be your passport to the future. As the largest anti-aging organization in the world, we are dedicated to finding scientific ways to prevent disease, slow aging, and eventually stop death.

For more than two decades, Life Extension has been at the forefront of the movement to support revolutionary anti-aging research that is taking us closer to our goal of extending the healthy human life span indefinitely. We inform our members about path-breaking therapies to help keep them healthy and alive.

Join today and you'll receive these life-prolonging benefits:

- **A subscription to *Life Extension* magazine** ($59.88 yearly newsstand value)...Over 100 full-color pages every month are filled with medical research findings, scientific reports, and practical guidance about using diet, nutrients, hormones, and drugs to prevent disease and slow aging.
- Access to a toll-free phone line to speak with **knowledgeable health advisors**, including naturopathic doctors, nutritionists, and a cancer expert, about your individual health concerns. You can also receive help in developing your own personal life extension program.
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