

CRYONICS



2nd Qtr. 1996

A PUBLICATION OF THE ALCOR LIFE EXTENSION FOUNDATION

Volume 17:2

RIGHT-TO-DIE LEGISLATION...

...and to put them where they rightly belong, in the hands of the people."

...following the constitutional mandate to take such decisions out of the hands of the government, both state and federal,

...permitting the individual to exercise the right to choose we are

... AND HOW IT AFFECTS CRYONICS

BY DAVID BRANDT-ERICHSEN

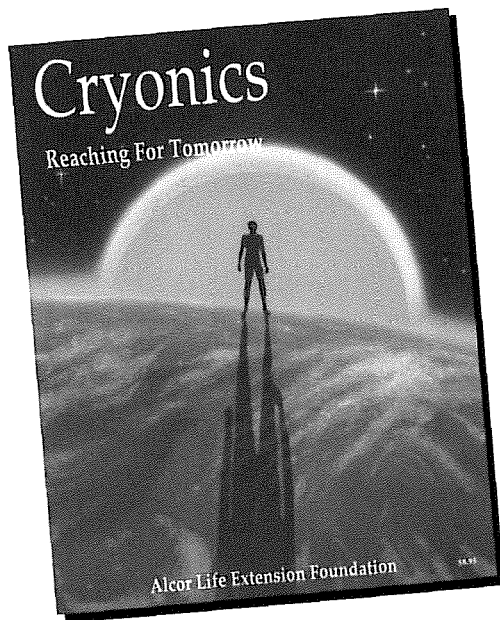
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\$4.50

“What is cryonics?”

Cryonics is the ultra-low-temperature preservation (biostasis) of terminal patients. The goal of biostasis and the technology of cryonics is the transport of today's terminal patients to a time in the future when cell and tissue repair technology will be available, and restoration to full function and health will be possible.

As human knowledge and medical technology continue to expand in scope, people considered beyond hope of restoration (by today's medical standards) will be restored to health. (This historical trend is very clear.) The coming control over living systems should allow fabrication of new organisms and sub-cell-sized devices. These molecular repair devices should be able to eliminate virtually all of today's diseases, including aging, and should allow for repair and revival of patients waiting in cryonic suspension. The challenge for cryonicists today is to devise techniques that will ensure the patients' survival.



“How do I find out more?”

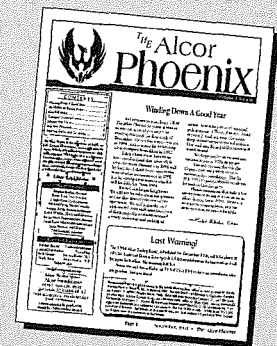
The best source of detailed introductory information about cryonics is *Cryonics: Reaching For Tomorrow*. Over 100 pages long, *Reaching For Tomorrow* presents a sweeping examination of the social, practical, and scientific arguments that support the continuing refinement of today's imperfect cryonic suspension techniques, in pursuit of a perfected “suspended animation” technology.

This new edition features an updated and lengthened chapter on revival, as well as the appendices “The Cryobiological Case for Cryonics” and “Suspension Pricing and the Cost of Patient Care.” Order your copy for \$7.95, or receive it FREE when you subscribe to *Cryonics* magazine for the first time. (See the Order Form on page 40 of this issue.)

For those considering Alcor Membership. . .

If you're intrigued enough with cryonics and Alcor that you're considering Membership, you might want to check out *The Alcor Phoenix*, Alcor's Membership newsletter. *The Phoenix* is a Membership benefit, so it's free to Members and Applicants, but anyone can receive it for \$20/year (\$25/year if you live overseas). It's released 8 times each year, on the “off months” of the quarterly *Cryonics* (February,

March, May, June, August, September, November, and December). *The Phoenix* is shorter than *Cryonics*, but appears twice as often and is mailed First Class. Being a Membership newsletter, *The Phoenix* focuses on Membership issues such as financing cryonics, staff and management matters, developments in Patient Care and Emergency Response, etc. These issues will impact you directly if you decide to become a Member, and may help you make a more informed decision in the meantime.



Feature Articles

**The Alcor Cryonics
Technology Festival**
Robin Helweg-Larsen

Right-To-Die Legislation
David Brandt-Erichsen

**Toward a Measure of Ischemic
Exposure**
Michael Perry, Ph.D.

**Infectious Disease:
A Long Way from Defeat**
Stephen Bridge



**Notes
from the
President.....8**

Stephen W. Bridge

For the Record.....3

Michael Perry, Ph.D.

The Donaldson Perspective....22

Thomad Donaldson, Ph.D.

C O L U M N S

DEPARTMENTS

Membership Status.....13

Ads and Personals.....10

Meetings.....29

Up Front.....2

Reviews.....25



UP FRONT

BY RALPH WHELAN, EDITOR

Alcor Members and subscribers to *Cryonics* may have noticed that the last couple of issues have been just a little bit on the thin side, by our usual standards. Although that will simply happen occasionally, the reason for it recently is we are making an extra effort to correct the tardiness in our publication schedule.

It's working. Over the last three issues we have advanced our release time to the tune of about nine weeks. We expect the process to be complete with the next issue, so bear with us.

The major feature in this issue is Alcor Member David Brandt-Erichsen's "Right-to-Die Legislation" article. The possible implications of this new legislature on the practice of cryonics are many, and David had done a remarkable job of gathering the relevant rulings and anecdotes into a detailed (but concise) account. Moreover, David presents the data in light of its relevance to us as cryonicists.

I would also like to encourage a close reading of this issue's "Notes from the President," by Steve Bridge. In it he describes many of the fascinating new goals and projects of the Alcor staff, as well as a few things we'll need your help to pull off.

Enjoy!

News Notes

Suspension news

On March 4th, 1996, Alcor performed a whole body suspension on a male AIDS patient. We are not releasing his name at this time, because it is unclear whether or not he requested privacy be continued after the suspension. However, the patient signed up while terminally ill, so he was probably not known to most (if any) readers of *Cryonics Magazine*.

The patient had an exceptionally long list of infections, which created special infectious control and safety problems for the suspension team. This has led us to rethink some of our procedures, and we are considering making some expensive modifications to our operating room.

A full report will be given in a later issue of *Cryonics* magazine

Alcor now has 13 whole body patients and 19 neuropatients for a total of 32. By our count, there are now 67 patients in suspension at the four public storage facilities.

Alcor Hires New Researcher

We are pleased to announce that this week Alcor has hired, as a part-time staff researcher, cryobiologist Sergei Ochkur, Ph.D., who moved to Phoenix last year

from the Ukraine. Dr. Ochkur received his doctorate from the Institute for Problems of Cryobiological Sciences and Cryomedicine, Kharkov, Ukraine in 1990. He has 14 years of experience in the biochemistry of sperm freezing, and he is eager to begin working on the problems of cryonics. More on Dr. Ochkur is listed on Alcor's Web page.

We don't have an e-mail connection for Dr. Ochkur quite yet; but it will be sochkur@alcor.org within a few days.

Alcor on "Next Step"

Look for Alcor's latest media exposure on the Discovery Channel, a speculative science show called "Next Step." This will be one segment in a "magazine" type show. Air dates:

Wednesday, May 8

9:30 PM

1:30 AM

Saturday, May 11

6:30 PM

NOTE: This is *not* the same as the hour-long documentary being prepared for broadcast on The Discovery Channel this summer or fall. We'll announce dates on that as soon as we have them.

PUBLICATION NOTES

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Editor: Ralph Whelan

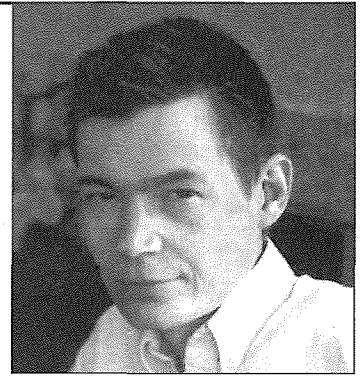
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About the Cover

The cover of this issue was designed by Ralph Whelan, using Aldus Freehand™, Aldus Pagemaker™, and Corel Gallery™.



The Federov File: Glimpses of an Elusive Immortalist

Readers may remember an article I did several years ago on Nikolai Fedorovich Fedorov, “the grandfather of immortalism,” a Russian philosopher who lived from 1829 to 1903.^{1,2} Fedorov (pronounced and sometimes spelled “Fyodorov”) was

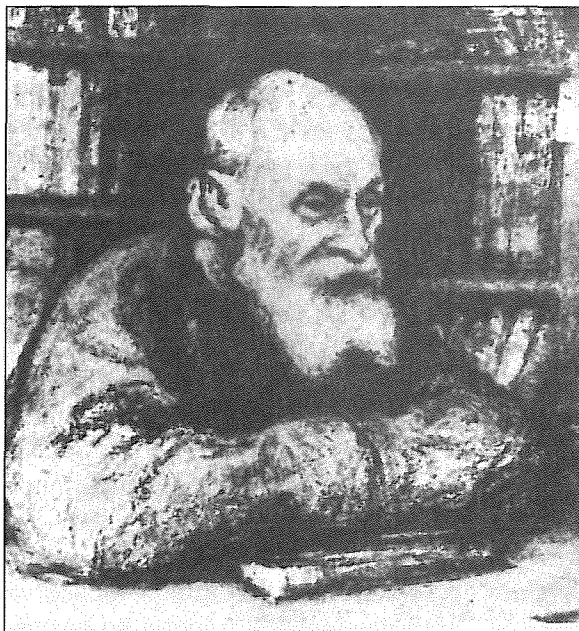
the first to seriously consider the possibility of conquering death—all death, past, present and future—scientifically, and devote an extensive body of writing to the subject. Fedorov recognized the value of preserving relics and information from

conventional scientific wisdom it seems preposterous, perhaps even more so today than in Fedorov’s time, a century ago. Yet there are those—myself included—who take it seriously, at least as a possibility in a more remote future.)

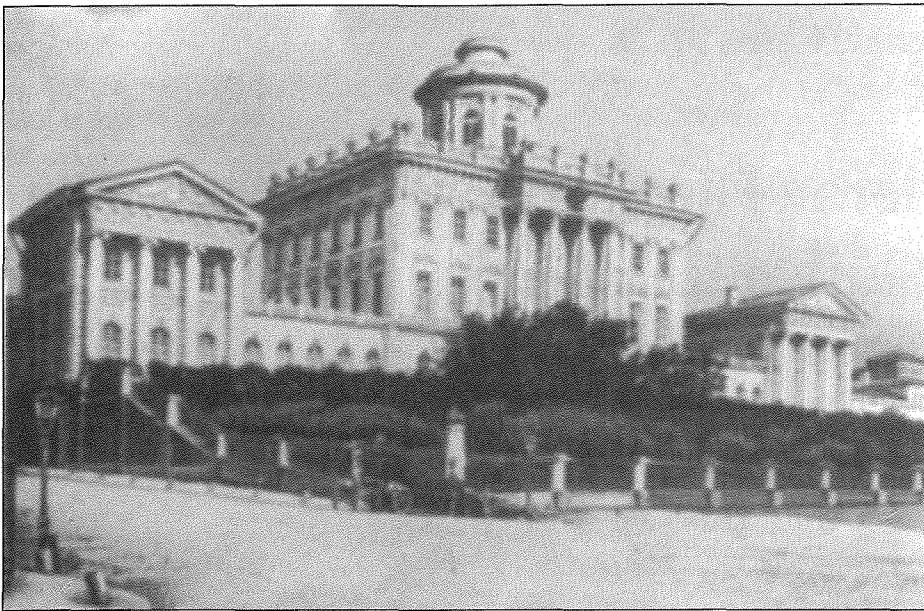
the past and prized museums. He conceived a vast resurrection project, a “common task” in which all would participate. The dead of one generation would be restored to life, and would then join the effort to restore their predecessors. Any surviving information about deceased persons would be used, together with whatever could be inferred about them using yet-to-be developed scientific tools. (This of course—resurrecting the unfrozen dead—is a far more radical idea than resuscitating cryonics patients. By more

More generally, Fedorov was a strong proponent of the use of technology for the betterment of mankind. Though a man of vast learning (in which he was largely self-taught), he identified with the “unlearned” peasants and their struggle for subsistence, and constantly challenged academics (the “learned”) for their passive stance on the real issues of importance, including survival itself.

Fedorov’s philosophical and scientific thinking is covered in more detail in my earlier article. Here I would like to present a more personal side of this enigmatic thinker, about which much is unknown, and may remain so. Indeed, it is only by a remarkable turn of events that we even know what he looked like, for Fedorov would not allow himself to



Fedorov—the best known portrait, by L. Pasternak



The Rumyantsev Museum, where Fedorov worked as librarian.

be photographed or sketched.

Fedorov was a man of ascetic habits who lived alone in a closet-sized room and slept on a humpback trunk with a book for a pillow. In fact he was almost pathologically self-effacing. Nothing of the little he published in his lifetime bore his name; a much larger body of his writing came to light only after his death and with the prodigious editorial effort of his two disciples, Peterson and Kozhevnikov. Generally Fedorov did his utmost to remain incognito, while expounding the most profound philosophical ideas and arousing the keen interest of his thinking contemporaries, who themselves were sometimes unable to learn who he was. As a consequence, many of the details of Fedorov's life today are obscure.

Among them, we are not entirely sure why he was so obsessed with this very obscurity, a stance that is certainly contrary to his professed interest in resurrecting the past. The latter involves bringing information to light, not concealing or obliterating it—and at the personal level is important. If there was something particularly embarrassing in his own past that he was trying to hide, there

is no hint in the literature. Clearly Fedorov had an inborn shyness, along with a general desire to renounce worldly preoccupations. There is also a strong sense of guilt in his writings, about the human race and its misdeeds, but perhaps it extended to himself as well. Politics must have played a role too. Czarist Russia, where Fedorov made his home, was not the democratic U.S.A., and he had family connections that could have posed problems, or on the other hand, may have particularly inspired a life of self-denial.

Fedorov was the illegitimate son of a Russian nobleman, Pavel Ivanovich Gagarin (a distant relative of the Russian astronaut Yuri Gagarin who was the first man to orbit the earth, in 1961). He was born and spent his early life probably around Tambov, some 200 miles southwest of Moscow. When he was three or so, in 1832, his father died. The young Fedorov—due to illegitimacy he did not bear his father's surname, but probably that of his godfather—was briefly cared for by his grandfather, Ivan Alekseevich Gagarin. But the elder Gagarin soon died also, and Fedorov, his mother, and several sib-

lings (he appears to have had at least one brother and possibly two sisters) were forced to leave the fine estate, though some provision seems to have been made for his education.

Of Fedorov's mother almost nothing was known until recently, but now more information has come to light: she was Elizaveta Ivanova, a young noblewoman.³ In any case Fedorov, evicted in early childhood from a prince's household, would later identify with and choose to remain one of the poor, though he might well have acquired wealth through his talents. To him, the humble peasants were the true representatives of what is best in humanity, not the dissipated rich. Perhaps this impression was heightened by Fedorov's own high-born relations: a second cousin on his father's side, for example, was the famous anarchist P. A. Kropotkin (1842-1921) who was arrested and imprisoned in the 1870s by the Czarist government.

For his own part, Fedorov was a staunch supporter of the Russian monarchy, but he may have feared interference because of his family connections or associates or because of the radical nature of some of his ideas. In fact Fedorov's principal disciple, N. P. Peterson, served a six-month prison term in his youth for contacts with "Hell," a terrorist group. (It was Fedorov himself who converted the young zealot away from revolutionary activities to be his devoted follower and literary assistant.) Another possibility is the fear of ostracism by the Russian Orthodox Church. Fedorov, despite a scientific orientation, was also deeply religious, believing that through a universal, human-engineered resurrection, mankind would fulfill a Christian commandment. But this did not fit well with the traditional idea of a transcendent resurrection, to be carried out by God rather than mankind.

Some of the still-considerable



Left: Sketch of Federov by L. Pasternak, apparently made surreptitiously in the Rumyantsev Museum library.
Right: Federov in his coffin, photographed by L. Pasternak

mysteries of Fedorov's life and temperament may be cleared up if more records come to light. Here we must limit ourselves to what is definitely known—which still makes an interesting story, and not a story I can tell in its entirety, but as is often the case, only pared down to some highlights.

Fedorov's remarkable reclusiveness is illustrated by his contact—by proxy—with the great Russian writer F. M. Dostoevsky. Actually it was Peterson who made the contact, starting in 1876, and began outlining the philosophy of his mentor, without naming him. Dostoevsky was much impressed, returning a letter asking, among other things, who was "this thinker." But he would never learn. Fedorov and Peterson started a reply, which dragged on and was still unfinished at Dostoevsky's death in January 1881. (It would extend to hundreds of pages, finally appearing as *The Question of Brotherhood*, Fedorov's only full-length book, which was published posthumously in Vol. 1 of his collected works.) Years later, in 1897, Peterson contributed an article on Dostoevsky's

letter to a periodical, *Don*, to which Fedorov added an anonymous preface praising the writer for his ideas about resurrection. Quoting from the beginning:⁴

"We have by chance come upon a letter of F. M. Dostoevsky's, one which is very important for the characterization of his religious convictions. And we have decided to publish this letter in the newspaper which you edit, with minor deletions of passages not relevant to the expression of the, to us, startling thoughts of Fedor Dostoevsky.

"In the letter there is discussion of some unknown thinker or other, of whom there are now so many in Russia and who need not concern us here—what is important to us is the thought of Fedor Dostoevsky himself—thought of amazing greatness—this thought gives a meaning and goal to life, which is precisely what is lacking in our time, when due to the loss of a goal and a meaning, life has lost all value.

"Dostoevsky says in his letter that: 'the most essential thing is the duty to resurrect the ancestors who lived before,' i.e. our duty, our obligation, our task consists, consequently, in the resurrection of all that has died, all that has been lost by us, as sons, as descendants of our fathers and ancestors."

Here Fedorov's determination to conceal his own contribution seems almost ludicrous, or alternatively, a calculated move to promote his ideas by linking them with someone famous (and dead, an important additional consideration). The "some unknown thinker or other" is of course Fedorov himself. Moreover, he actually misrepresents Dostoevsky, who really said in reply to Peterson, "In your account of this thinker, the most essential thing, without a doubt, is the duty to resurrect the ancestors who lived before."⁵ Dostoevsky is commenting on Fedorov's thought, whereas Fedorov is attributing this very thought to Dostoevsky himself! In fact Dostoevsky did have ideas on



Death mask of Fedorov, made and sketched by L. Pasternak.

the subject of resurrection that paralleled Fedorov's, though, it seems, without the emphasis on a scientific approach and, very significantly, without seeing resurrection as a project for future humanity to carry out, as Fedorov did. (By another strange twist of irony, in a later article, printed posthumously, Fedorov criticizes Dostoevsky for mysticism in his ideas about resurrection!)

For the last three decades of his life, Fedorov worked in Moscow as a librarian, first in the Rumyantsev Museum Library, then, from 1898, in the reading room of the Moscow Archives of the Ministry of Foreign Affairs. He carried on a lively exchange with his contemporaries, maintaining his austere and self-effacing regimen, but ever as the joyful saint. At times his friends would almost forcibly settle him in comfortable living quarters, arrange with the landlord for at least one meal a day with two courses, and supply him with furnishings such as a bed. But,

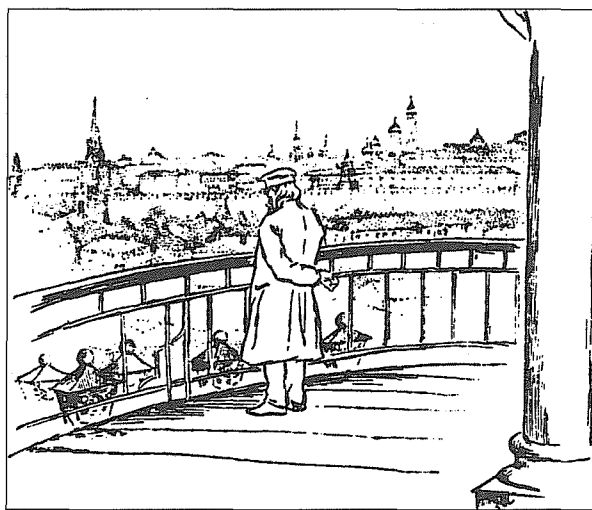
checking a few days later, they would find he had given away the furnishings and was back to his usual fare of tea and rolls. His reticent habits continued as always, and extended even to such personal details as his own portrait, which he would not permit to be made, either by photograph or the artist's hand.

Some time in the 1890s a painter, Leonid Pasternak (father of Boris the writer and Nobel laureate) was working in the Rumyantsev Museum and noticed the old man with the flowing beard and fiery eyes. Upon trying to sketch him, it became clear that his subject didn't want to be sketched. But rather than give up Pasternak adopted a stratagem in which he pretended to be absorbed in reading, using a stack of books to hide the drawing he was making. We also have a sketch of Fedorov made by one M. I. Shesterkin, again it is thought in the 1890s. Fedorov is gazing down from the balcony of the Rumyantsev Museum, but his back is turned hiding most of his face. When Fedorov died in December 1903, Pasternak was again on the scene, making some photographs of the body in its coffin, and also a death mask. At some point he would also make the more detailed drawing that is our best and best-known representation of Fedorov, and also a painting, "The three wise men," showing Fedorov with his contemporaries, Solov'ev and Tolstoi. It is largely due to Pasternak, then, that we know what Fedorov looked like.

When Fedorov died he left behind no corpus of finished works but only disorganized piles of manuscripts in varying stages of completion and revision, mostly un-

published. (It would seem he could have used a word processor!) The task of arranging this material into readable form fell to his two disciples, Nikolai P. Peterson (1844-1919) and Vladimir A. Kozhevnikov (1852-1917), who produced volume 1 in 1906 and volume 2 in 1913, naming the work *The Philosophy of the Common Task*. Together the two volumes ran to some 1200 pages. A third volume was also to have appeared, but the editors died before it could be completed. About this time the Bolsheviks gained power in Russia. Over the next decade there was interest in Fedorov and his ideas, particularly in view of his scientific approach, but official disfavor mounted (Fedorov had been firmly opposed to socialism, for instance), and his following was suppressed. (In fact many Fedorovians or "Cosmists" apparently were killed under Stalin's regime.⁶)

Last year I began an attempt to obtain photographic materials on Fedorov including, if possible, a copy of the death mask. (The thought of having the elusive Fedorov in full-size 3-D seemed exciting, and being an amateur artist myself, I had in mind sculpting a bust based on the mask.) By then, a Fedorov Society



Fedorov on the balcony of the Rumyantsev museum. Sketch by M.I. Shesterkin.



N.P. Peterson

had come into being in Russia—I'm not sure when it started. I contacted Dr. Alexander Khalyavkin, a member of the Society who is also in the Russian Academy of Sciences and is interested in anti-aging research. "Alik" told me the death mask had been lost but a sketch of it had survived; there were other photographic materials too that the Society could furnish inexpensively. I ended up paying \$40 plus \$22 overhead for ten pictures approximately 7 by 9 inches each—and instead got thirteen pictures. Many of them are blowups of old halftones and somewhat grainy (this is why Alik insisted on sending more)—but all appear to be the best available. (The grainy halftone screen can be removed after the pictures are scanned but there is some loss of sharpness.) Some images from this "Fedorov file" are included.

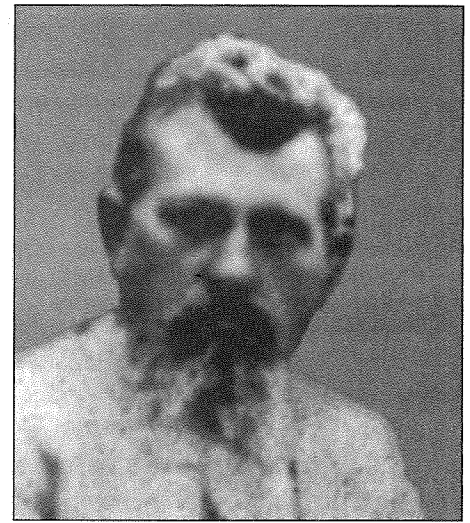
And here are some closing, speculative thoughts on Fedorov's reclusiveness and immortalism then and now. It must have been tough being an immortalist then—it isn't easy now, in our more technological age, and few so far have made the grade. Fedorov was trying to live in two worlds, both of which were important to him: the world of contemporary Russian society, with empha-

sis on the peasantry and their struggle for life, and the contrasting paradise of his own thinking—a world beyond death that science would one day bring. The two, he must have realized, were incompatible and mutually exclusive. Russian peasantry with its Orthodox Christianity would have had little sympathy with scientific immortalism, in which man, not God, is to be the principal agent for bringing about the eternal estate. The Church might excommunicate Fedorov, as indeed it did excommunicate his contemporary, Tolstoi, who was less radical in his cosmological views but more open in advocating them. Fedorov was an immortalist—he was not ready to give that up. But outside a small circle of friends, *that fact must never be known in his lifetime*. And it never was.

Probably something of this thinking has hobbled many cryonicists and would-be's in more modern times too, keeping some from signing up at all and forcing others to practice their involvement in secret. Even the non-religious face "excommunication"—social ostracism—in one form or other. That's the way it still is today—but along with technological progress we see refreshing signs of a change in attitudes. The mainstream seems increasingly favorable to cryonics, being less critical of those who advocate and practice it, and giving more serious thought to our basic position that immortality is attainable through science. This trend should continue and, we may hope, in time develop into a new "orthodoxy"—before we can finally rest our case and reap the benefits!

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2. Semenova, S. preface to *N. F. Fedorov, collected works, v. 1 5* (Izdatelskaya gruppa "Progress," Moscow, 1995; in Russian—My



V.A. Kozhevnikov

thanks to M. Soloviov for noting this reference and translating appropriate parts—MP).

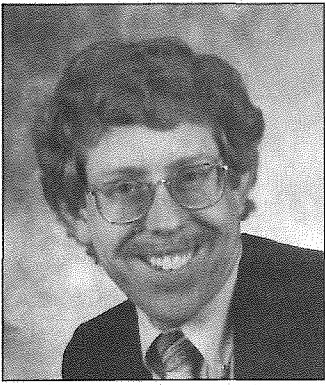
3. Semenova, op. cit. 7.
4. Young, G. *Nikolai F. Fedorov, an introduction*, Nordland, 1979, 48, quoting (in English translation) an article from *Don* #80, 1897 (I have used the more common spelling "Dostoevsky" in my quote—MP.)
5. Young, G. op.cit. 39.
6. Soloviov, M. "The Russian trace in the history of cryonics," *Cryonics* 4th Q 1995, 21.

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*In English unless noted otherwise.



An Invitation to a Party

Alcor is trying to give you all the time in the world. I need a few minutes of your time in return.

Part of the reason you may have trusted and joined Alcor in the first place was *because we are a non-profit organization*. Non-profit organizations run on public donations. Those contributions are essential for Alcor's survival and growth, which translates into *your* survival and growth in the future.

Here in Scottsdale, Arizona, in our Patient Care Room, thirty-two very interesting people rest, waiting for Alcor to become strong enough to hire scientists clever enough to revive them. These patients include names familiar to most of you, because you knew them or because we told you their stories: Jerry Leaf, Arlene Fried, Dick Jones, James Bedford, Andy Epstein, Stan Penksa, Teresa Cannon, and many others. A lot more people just as fascinating will be joining them in the next several decades. What a "com-

ing-out" party that will be someday!

That party may include friends and relatives of yours. We hope it will include *you*, too, whether after your own suspension and revival or because you get lucky enough to avoid the need for suspension yourself. We have a lot of work to accomplish before that happy day arrives. That work requires Alcor to be larger, richer, and stronger, which means help from our members, our subscribers, and even from that part of the general public which wants to keep the cryonics option viable for them in the future.

By now, those of you on our mailing list have received this year's MAST (Make Alcor Stronger Today) appeal in the mail. Please contribute some amount to Alcor's progress. You'll help your current friends, the new friends you'll meet at that future party, and yourself.

Let me tell you about some of the uses we have for your contribution:

1. *Staying where we are*. That's an odd phrase perhaps, but it should remind you that your Alcor dues only provide about 40% of Alcor's operating income for the year. For the remainder we depend on contributions from you living members and on donations from the estates of some suspended members, especially Richard Clair Jones. We anticipate the Jones money will begin dropping off next year, and we need your ongoing and increased contributions so we can continue to provide the current level of service without losing ground.

2. *Membership growth*. Wouldn't it be a lot better if we had ten times as many members paying dues and making donations? Wouldn't you

feel safer being part of an organization of 3,800 instead of 380? This takes effort through advertising, public relations, interviews and speeches, and many telephone calls and letters to publicize cryonics and Alcor. Then we have to contact interested people and move them through the sign-up process. Alcor needs donations to pay for ads, new publicity materials, postage, and printing. We also want to display our ideas at more health fairs, science fiction or space technology conventions, and local business conferences.

For example, we would like to pay for at least the following projects this year:

■ An updated version of *Cryonics: Reaching for Tomorrow* will be required by the end of the year. Estimated cost for writing and printing 5,000 copies: \$8,000

■ We are designing a new, simplified color brochure about Alcor to catch people's attention. Estimated cost for 10,000: \$3,500.

■ We will have a booth at the Scottsdale Chamber of Commerce "Business Showcase" in April to meet local businesspeople. Cost for booth and materials: \$400.00

■ On August 29 through September 2nd, we plan to exhibit at the World Science Fiction Convention in Los Angeles. Several staff members and volunteers will be needed to work at Alcor's booth and to host room parties. Estimated cost of booth, materials, rooms, transportation, and party supplies: \$3,000.

■ In December, we will again have a booth at the 4th International Conference on Anti-Aging Medicine in Las Vegas. Estimated cost for booth, rooms, transportation, and materials: \$2,500.

■ We would like to try some ads in several science and technology magazines that have reasonable ad rates. Cost per ad: \$500-1,000 per issue. (By the way, watch for Alcor's full-

page ad in the May issue of *Reason* magazine. This was partly paid for by a donation.)

■ One of our members has an interesting idea for experimental radio spots. She can produce them for free and we can test them in different markets for around \$500-1,000.

■ Someday we will need a full-time Public Relations Director. Brian Shock and I do most of that work right now; but there is plenty for a full-time person to do. We could be doing a radio show, media tour, or talks to local medical, scientific, or community groups every day if we had time. Estimated salary required: \$25,000 +

[Another **MAJOR** event to watch for: The Discovery Channel will be broadcasting a one-hour, in-depth documentary on cryonics sometime this Summer or Fall. This show will feature interviews with many leaders of cryonics organizations, including several Alcor members. The crew also filmed the Stanley Penksa suspension. I expect this to be the best television piece on cryonics ever made.]

■ We know that many of us became interested in cryonics through contacts with cryonicists in our local areas. We would like to devote more time to encouraging local coordinators and group, but that will require either some extremely dedicated volunteer or the time of a current staff member.

3. *Staff salary improvements and staff expansion.* One of Alcor's biggest challenges has always been how to get and keep qualified, dedicated employees. The average Alcor salary for the six full-time employees is only \$16,581. This is better than the average of about \$14,000 four years ago; but hardly adequate to encourage long-term employment of capable individuals. If we are to keep good workers in these positions and—

as the inevitable turnover occurs, to replace them with employees who are equally good or better—we need to pay adequate salaries.

We also need to train back-ups to our suspension personnel, especially Dr. Nancy McEachern, Tanya Jones, and Hugh Hixon. If one of these people is on vacation during a suspension, or if we have two suspensions back-to-back, we still need to get the job done. Also, if one of them leaves to take employment elsewhere or otherwise becomes unable to perform suspensions, it will take a lot more money to find technically qualified people to replace them.

We could use more technical/electrical/mechanical help right now for Hugh Hixon, whose list of tasks is overwhelming. Hugh is involved in suspension preparation and planning, technology development, and biological/chemical research. He is also Alcor's Facility Engineer and all-round handy man. Tanya (who is still doing a job that five years ago was being performed by two people) really needs an assistant so she can catch up from Alcor's five suspensions in the past 14 months, train more transport team members, revamp Alcor's inventory system, and increase our contacts with overseas groups. Sometime in the next two years we would like to add a secretary/receptionist/file clerk and a full-time night-schedule employee to handle those 5:00 a.m. phone calls and other tasks.

4. *Technology for better suspensions.* Well, of course. How obvious—you want a better suspension in five years than you could get today. That will only happen with progress. First, we need more of what we already have. For example, as Alcor grows, small pockets of our members around the country need their own ice baths, heart-lung resuscitators, and transport medications. Yes,

many groups will be able to pay for these items; but the initial purchase will have to come from Alcor. One Alcor member (Hara Ra) from Northern California has already donated \$2,500 toward this project. His donation might help your friends and family. We could use that kind of help from you, too.

Advertisements and Personals

Cryonics magazine reserves the right to accept or reject ads at our own discretion, and assumes no responsibility for their content or the consequences of answering these advertisements. The rate is \$8.00 per line per month (our lines are considered to be 66 columns wide). Tip-in rates per sheet are \$140 (printed one side) or \$180 (printed both sides), from camera-ready copy.

EXTROPY: The Journal of Transhumanist Thought #16

Neuroscience pioneers on: artificial neurons, AI, fuzzy neural nets, memory, imaging the brain; Idea Futures on the Web; Better Sex Through Chemistry; Advances in technology; Melatonin and dreaming; Julian Simon, and much more. 68pp, \$5; \$17 for one-year (4 issue) sub, \$32 for 2 years, from Extropy Institute, 13428 Maxella Avenue, 373, Marina del Rey, CA 90292. exi-info@extropy.org

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Venturist Monthly News promotes immortalist philosophy. For free sample write: The Venturists; 1547 W. Dunlap; Phoenix, AZ 85021.

Do you want to keep up with science and technology bearing on cryonics? *Periastron* is a science newsletter written by and for cryonicists, only \$2.50 per issue. *Periastron*, 80-Q N. Cabrillo HWY, #247, Half Moon Bay, CA 94019-2172.

Are you still healthy? Want to delay suspension? A book for users of *Antiaging Drug* tells the good and bad of each one. Send for free brochure. *Periastron*, 80-Q N. Cabrillo HWY, #247, Half Moon Bay, CA 94019-2172.

We need to spend more time training our suspension team by doing large-animal suspension research. Each training session with a dog or pig will cost us at least \$6,000. We also want to pay for the team members to attend classes and seminars in other locations. This might cost \$1,000 each. We need to train transport technicians in more areas of the country. Each one of these sessions runs in the neighborhood of \$1,000 and while Tanya or someone else is teaching it, they are unavailable to do other work. We also need to continue our progress in getting more medical professionals involved.

Then we need to work on ideas that represent real progress: a better ice bath and Mobile Access Rescue Cart; better methods to store and inject our chemical solutions which protect the patient's cells; more portable units for faster patient transport; better data collection during the suspension; more rapid cooldown methods.

5. *Technology for SAFER suspensions.* Our most recent suspension in March, 1996 was of a patient with advanced AIDS and a long list of other diseases, possibly including tuberculosis. Future AIDS patients are likely to have even more dangerous infections; but we have committed ourselves to saving our members with HIV. We learned this time that our operating room was not well designed for infectious disease control, especially in the air-conditioning system. Our concern for the team members' own health forced us to perform the glycerol perfusion in the preparation room of our local cooperating mortician, whose facility was better set up for this.

We need to redesign Alcor's operating room to be safer and cleaner for us all. This is likely to require professional consultants on infectious disease and hospital construction, a

new air-handling system, sealed doors, advanced protective clothing and gear for the team, and other expensive safety additions. Total cost: at least \$20,000.

Our ambulance for patient transport is now 20 years old. It is too small for many of the tasks we would like to use it for, and we never know when it might break down at a critical moment. Even a used (but newer) ambulance will cost us at least \$10,000 and a new one would be very expensive.

6. *Pure research.* There is still much work to be done on the mechanisms of freezing damage, prevention of ischemia, freezing rates, improved perfusion chemicals, and the cracking problem. As we begin to understand these problems and to improve our suspensions afterward, we need to help promote the final area of research: cell and brain repair to revive patients. We can't do this by ourselves, I suspect; but even now we need to be spending time with schools to show bright young scientists the directions in which they might look. Cost: millions of dollars; but every journey begins with a single step.

One beginning step is to hire or help fund scientists in the fields of organ preservation. Even \$50,000 can achieve significant progress in these early days of organ preservation research.

In this vein, we are pleased to announce that previous research donations have allowed us to hire Dr. Sergei Ochkur, a Ukrainian cryobiologist, as a part-time staff researcher. More on Dr. Ochkur next issue.

We also have a local research hospital willing to work with us on some joint brain preservation projects; but they cannot provide the funds. The projected "stake" required to get into this particular game:

\$75,000.

7. *Patient Care Security.* Because Alcor moved away from the earthquake zone, the patients are much safer today. We have also enhanced fire safety for patients by adding sprinklers, alarms, and better fire walls. But we aren't satisfied. We have ideas that could protect the patients against almost any fire, structural damage, or assault from vandals; but these will cost about \$10,000.

It's your organization, to support

or not, as you choose. However, if the reason you joined Alcor is to save your life, you want Alcor to be the best it can be. The goal is the same if you want to save your friends and family. I sincerely hope that many of you also realize that the success of cryonics will contribute to making this world a better place for all of us to live.

When you see that MAST request for donations, remember the reasons we are asking for them. You are welcome to give a general donation or a gift toward one of the specific goals I have listed here. The

more you support Alcor, the sooner we will be able to put on that great future party—and the more friends and family who will be there. See you there!

R.S.V.P.

Alcor has a new Web Page!

Check out <http://www.alcor.org> and spread the word!

Our new site boasts regular updates, a full set of Alcor membership application materials, excerpts from recent issues of *Cryonics Magazine*, and the complete text of our handbook, *Cryonics: Reaching for Tomorrow* (special thanks to Alcor Member Mark Muhlestein for volunteering his time and effort scanning the text of *CRFT*).

This site still requires plenty of work, however.

What would *you* like to see there? Nancie Clark pointed out to me that I didn't have a link to her Web Page, and I was more than happy to correct this oversight. Alcor's members are its best recommendations; if you have a Page and want to set up mutual links with Alcor, let me know!

Finally, I'd like to thank Dave Cosenza for his painstaking work on Alcor's previous Web Page, much of which served as the basis for our current Page.

ALCOR LIFE EXTENSION FOUNDATION

World's Largest Cryonics Organization
Providing State-of-the-Art Cryonics Services Since 1972

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Cryonics (Cry-ON-ix) n.

The freezing of legally dead humans, in hopes that they can someday be resuscitated.

1946: When your heart stopped, physicians gave up and pronounced you dead.

1995: When your heart stops, physicians administer CPR, medications, and defibrillation --

Sometimes you return to many healthy, happy years of life!

2046: Medical advances may have pushed back the barrier of death further than we can now imagine!

The Alcor Foundation is *your* ambulance to that future of advanced medicine.

Call us at [1-800-367-2228](tel:1-800-367-2228) and let us tell *you* how to see the future with Alcor!

The Alcor Cryonics Technology Festival

Conference Report by Robin Helweg-Larsen

The really nice thing about being at a gathering of cryonicists is the reaffirmation that together you can—and are already starting to—change the world for the better. This is what it must have felt like to have been a Christian in the first century, or a Communist in the nineteenth. A new way of understanding society is being created, and the change in understanding will change human society itself. Ultimately, of course, the issues become irrelevant, and society laughs at your quaintness and moves on again; but for now, this is the cutting edge of social transformation on the planet.

If you were suffering through that east coast snowfall on the weekend of February 16-18, you missed out! Alcor picked those days to have a big *discussion* about freezing, but was wise enough to arrange for 75 - 80° weather for their Scottsdale location! Some fifty people attended this Alcor Cryonics Technology Festival, including residents of Hawaii, Canada, Spain, and Italy.

The program began on Friday, with registration at Ventureville. Ventureville is a 1.6 acre rural parcel with a couple of old wooden houses with screened porches, set in the middle of the northern sprawl of Phoenix subdivisions. The place retains its rustic flavor by having a street address on Utopia Avenue, but not having any entrance on that street. This allows everyone to drive

up and down the last remaining couple of blocks of rural mailboxes in confusion, feeling like they're really lost in the countryside.

Ventureville put on a nice buffet dinner, and groups of people drifted in and out all evening; depending on your definition, there were people there from every cryonics organization, and discussions meandered pleasantly. A Ukrainian scientist now working on research lives there with his family; Hara Ra had brought along his prototype of a cardiac arrest monitor and alarm system; the Ettingers, Chamberlains, and Merckles came through; and we all confidently solved the problems of the world.

This freedom to work out a train of thought in a supportive setting was the great joy of the weekend to me: to be able to discuss any aspect of cryonics and immortalism, and not have to defend or explain the underlying interest in them.

Do most humans have a genetic predisposition to avoid thinking about death as a reality, so that young men will believe themselves immortal and be prepared to risk their lives for the tribe (and young women will confidently undergo childbirth and risk their lives for their children at need)? At Ventureville, the idea is not extreme.

To take the idea further, those of us who *do* think about death must therefore adapt our presentation

methods, because we are atypical; we must be able to present cryonics in a way that allows people to deal with death without thinking about its implications of nothingness and soul-searching; cryonics needs to be presented as an option, a structure, a system, an ordinary choice, one box out of many to check off on a procedural form.

At Ventureville in this case the listener carried the idea forward, like a jazz player with his own interests and insights, pointing out that the logical place to do that is in a hospital, that the hospital people already think about death, at least the deaths of others, all the time, and are therefore a bridge between cryonicists and the general public, and could implement cryonic suspension as a fundamental medical protocol.

And then one or another of the people in the conversation elaborated the idea of developing rapport within a particular hospital, focusing cryonics work within a single district, to make it a normal hospital procedure in a normal hospital, to provide a protocol which could be referenced for the rest of the world; and developing that rapport through a concentration of cryonics residents, who would be active not just in dealing with that hospital, and knowing those people on staff, but also in electing the members of the hospital board....

This warm rambling of ideas, and putting faces to the opinions I have

read in CryoNet and the various publications, was the heart of the weekend for me. Don't get me wrong: CryoNet and *Cryonics* magazine are wonderful, but they are still thin broth compared to the banquet of personalities and ideas at the Festival.

The next day, Saturday, began with the opportunity to tour the Alcor facilities: see the offices, the photos of the "public" suspendees, the original dewar of James Bedford, who had himself suspended in 1967 and is now in Alcor's care; to look through the ambulance, the operating room, the cooldown and the storage facilities, and let Steve Bridge perform tricks with liquid nitrogen.

And then on to the heart of the festival, in the Thunderbird Best Western, near the Scottsdale Air Park. As President of Alcor, Steve Bridge hosted and opened the program; but much of the explanation of Alcor technology took place at the Alcor facilities nearby, and was not covered formally in the talks.

Ralph Merkle gave a report on the 4th Foresight Institute Conference, which is essentially a nanotechnology forum for the thinktank set up by Eric Drexler. It had been attended by some 300 people, twice as many as the previous Conference, indicating a breakthrough in scientific acceptance of nanotechnology, and allowing Ralph (who does research in computational nanotechnology at the Xerox Palo Alto Research Center, to state that "nanotechnology is not accepted by some eccentrics on the fringe." This progress, of course, is wonderful news for cryonicists: we suspend our family and friends in the knowledge that our primitive methods will require repair on the nano level in order to reverse suspension damage, let alone to re-energize and rejuvenate patients.

Ben Best, President of the Cry-

onics Society of Canada and Secretary of CryoCare, reviewed the anatomy of the human brain, describing the apparent functions of each area, and the implications for cryonics in terms of whether a neuro patient needs to have that particular portion repaired and restored in order to retain pre-existing memory and personality, or whether that portion of the mental processing functions can simply be replaced.

His current analysis is that much of the brain has merely processing and transmission functions, and is therefore replaceable, even upgradeable in future: the spinal cord, brain stem, autonomic nervous system (with a caveat concerning sexual arousal aspects), and cerebellum fall into that category. Other areas, such as the basal ganglia and hippocampus, have as yet unclear importance for emotion and learning; but it may be that everything other than the cerebral cortex is at most a replaceable coprocessor.

Thomas Donaldson then talked about memory and repair of the brain. His talk blended very nicely with that of Ben Best; in theory, the more that the individual's memories, emotions, and personality can be localized in the brain, the less physical material needs to be preserved; and the less that needs to be preserved, the better that preservation can be effected.

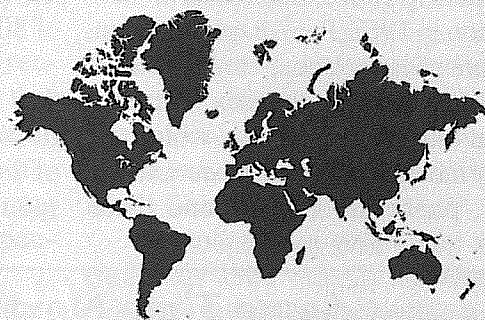
Thomas' famous brain tumor (now in remission) and subse-

quent legal battle for the right to be cryonically suspended before legal death, give an extra poignancy and urgency to discussions of what part of the brain is essential. Incidentally, Thomas' situation has been the start-point of a months-long Internet thread running in uk.legal and sci.cryonics.

There was a lunch break for ninety minutes, which gave an opportunity for people from the various cryonics organizations to further mix and discuss what opportunities there might be for collaborative work in the future. You could write a gossip column based on who sat with whom in cars on the way to various

Membership Status

Alcor has 376 Suspension Members, 488 Associate Members (includes 67 in the process of becoming Suspension Members), and 31 patients in suspension. These numbers are broken down by country below.



| Country | Members | | | Country | Members | | |
|-----------|---------|------------|-------------|---------------|------------|------------|-------------|
| | Members | Applicants | Subscribers | | Members | Applicants | Subscribers |
| Argentina | 1 | 0 | 1 | Japan | 0 | 0 | 3 |
| Austria | 2 | 0 | 0 | Lithuania | 0 | 0 | 2 |
| Australia | 12 | 1 | 7 | Malaysia | 0 | 0 | 1 |
| Belgium | 0 | 1 | 1 | New Zealand | 0 | 0 | 1 |
| Canada | 11 | 2 | 17 | Russia | 0 | 0 | 5 |
| Denmark | 0 | 0 | 1 | Spain | 6 | 0 | 0 |
| Estonia | 0 | 0 | 1 | Sri Lanka | 0 | 0 | 1 |
| Finland | 0 | 0 | 1 | Sweden | 0 | 0 | 2 |
| France | 0 | 0 | 2 | Switzerland | 0 | 0 | 1 |
| Germany | 2 | 0 | 1 | Taiwan | 0 | 1 | 0 |
| Holland | 0 | 0 | 2 | U.K. | 17 | 3 | 11 |
| Ireland | 0 | 1 | 2 | U.S.A. | 325 | 56 | 357 |
| Israel | 0 | 0 | 1 | Ukraine | 0 | 0 | 1 |
| Italy | 0 | 2 | 2 | TOTALS | 376 | 67 | 421 |

restaurants, and what they talked about at lunch. As a movement, cryonics draws great strength from the individuality of its members, from the fact that the movement is large enough to support competing groups, from the generation of alternative approaches to problems caused by the competition, from the ferment of ideas caused by the sharing of alternative approaches, and from the security of everyone realizing that we are all in a single intellectual lifeboat together.

After lunch, Paul Segall spoke on normo- and hypothermic blood substitutes. He reviewed the history of this work from Audrey Smith's paper to the Royal Society in the '60s on reviving hamsters whose internal temperature had been reduced below freezing, as well as the work done on hamsters, mice, dogs, and baboons, not just by others but by himself in his work with the American Cryonics Society, TransTime, and Biotime.

Having first helped with a suspension in 1968, Paul draws on a vast amount of experience. He sees blood substitutes as having uses in multi-organ human transplants, which already include the cornea, heart, lung, liver, pancreas, kidney, and bone

marrow. In addition, there is probable application in areas such as ice-cold bloodless surgery, detoxification of blood by hypothermic total body washout (for hepatitis, for example), and for high-dosage, organ-directed cancer chemotherapy. All this can provide immediate benefits for non-cryonics patients, as well as credibility, funding, and research opportunities for cryonics organizations.

Hal Sternberg, a colleague of Paul's and VP of Research at Biotime, dealt with recent and current work on rats and hamsters, and the statistics on skin transplant necrosis, knee joint viability and heart activity in perfused, cryoprotected, and control animals taken to temperatures ranging from -1°C to -196°C . Taken together, Paul and Hal's presentations suggest frustratingly slow progress towards our end goals, with a simultaneous sense of amazingly rapid breakthroughs when considered in the context of the extremely limited knowledge and funds of 30 years ago.

Bob Ettinger spoke next. As author of the 1964 book *The Prospect of Immortality*, as well as President of the Cryonics Institute and thereby sponsor of research being conducted

by scientists in Ukraine, he is undoubtedly the best-known, best-loved, and most highly respected individual within the cryonics movement. His talk reviewed many of the philosophical issues concerning the Self that impact the very idea of cryonic suspension and revival, and how much continuity is necessary to make cryonics a worthwhile endeavor. His definition of Self is "that portion or aspect that permits feeling," a broad definition that allows more individuality to animals than intelligence allows, and that relies less on the need to retain memory than Uploaders require.

As for memory, he states "I don't remember much about my childhood—I don't even remember much about my middle years. I don't care! I'm here—I feel good!"

He reviewed recent work reported by Olga Visser in South Africa, and the controversy surrounding the credibility and confusion of the reports of the viability of rat hearts taken to -196°C ; also vitrification interests of Greg Fahy, the recent non-glycerol perfusion reports from Mike Darwin, and Dr. Pichugin's procedures on sheep heads which resulted in freedom from cracking. Unfortunately, Bob's time ran short, and less information was explained than has clearly been developed recently.

Mark Voelker wrapped up the afternoon session. As Alcor's Director of Research, he spoke on recent initiatives to redesign dewars; to introduce a premixable perfusate, MHP2; to monitor the occurrence of cracks during cooldown; and to develop improved protocols for perfusates and speed which have resulted in a 90% reduction in cracking. A new research team is currently being gathered and trained, and additional facilities being put together, with work expected to focus on small animal models.

Same Time Next Year. . . .

If you missed out on this year's Festival, we plan a repeat at around the same time next year, though on a different weekend (to avoid conflicts with other mega-events going on in the metropolitan Phoenix area). So start thinking about it now. A total of 57 participants attended this year's Festival, and we wouldn't mind doubling that turnout next year.

Alcor Directors and Management wish to publicly laud the outstanding efforts of Tanya Jones, who spearheaded the organization of the Festival and managed to make it come off without a hitch more or less by herself, and Dave Pizer, who made the arrangements with BioTime for the hamster demonstration. We'd also like to thank all of the Festival Speakers, whose presentations were excellent.

Sunday's Agenda: A Matter of Life and Death—and Life

By Derek Ryan

For most participants at this year's ACT Festival, the most exciting event occurred Sunday afternoon at about 2 p.m. in CryoSearch's laboratory, when a tiny rodent woke up and started shivering. "Searcher" (as she was subsequently named) had just been washed out with an experimental plasma volume extender (Hextend), cooled to 0.4° Celsius, held at that temperature for nearly an hour (below 4° for a total of 90 minutes), transfused with donor hamster blood, and warmed back up to normal body temperature.

(We don't know how often in the history of humanity a group of adults has actually cheered aloud for a small animal who has done nothing more complicated than wake up . . .)

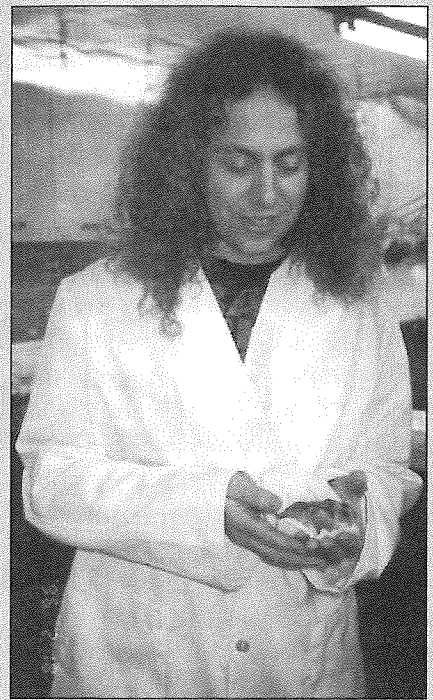
For the thirty-plus cryonicists who had gathered for the demonstration, it was an unprecedented opportunity to observe the process of small animal cannulation and washout

first-hand. The roughly four hour long procedure afforded plenty of time for detailed questions and answers, and the spontaneous, spirited conversations among observers and researchers alike allowed everyone to depart feeling more educated and enthused about the possibilities for research at Alcor.

This demonstration was performed chiefly by BioTime's Stephen "Tumbleweed" Kehrer and CryoSearch's Rhonda Iacuzzo, RN, with important assistance from Judy Muhlestein and Hugh Hixon. Alcor would like to congratulate these individuals, as well as the audience members, for making the day an undeniable success.

Finally, one last hurrah for Searcher herself, who is alive and well in CryoSearch's lab as this issue goes to press, set to live out her days as CryoSearch's heroic new mascot.

Yeah, Searcher!



Stephen "Tumbleweed" Kehrer presents "Searcher," the first hamster to survive hypothermic total-body washout in the CryoSearch Laboratory.

This ties in very nicely with the fundamental objections being expressed in uk.legal regarding cryonics: the lack of ability to demonstrate viability on even the smallest model. Acceptance of cryonics can be expected to increase dramatically once a repeatable protocol is developed for the cooldown and successful resuscitation of even the smallest mammal.

A buffet dinner was served in the hotel for all participants, and the after-dinner speaker was Gayle Pergamit. After all the technical discussion of the day, it was nice to step back and have a broad view of not just a specific society-altering concept like cryonics, but the very nature of mental readjustment that individuals have to make to open themselves up to new ideas and attitudes.

Steve Bridge then closed the ses-

sion, with a plea to everyone to recognize the vast and varying work that needs to be done, and for each of us to get with doing our part of it.

For myself, I took the opportunity to get my own Cryonic Suspension Agreement signed!

I was unable to attend the Sunday activities, but see the box above for Derek Ryan's account.

Finally, to exercise the prerogative of a cryonicist and be opinionated: perhaps a future festival, assuming it isn't all abuzz with some hot new breakthrough, should include workshops for people to plan out how to move the various fields of cryonics forward: research, of course, and the event was billed as a Technology Festival; but also organization, membership, fund-raising, community support, legal positions, political backing, lecture circuits, fic-

tion/nonfiction books, movies, tv programs, designing standard hospital protocols. . . you choose your area of interest, there is essential work that needs doing.

If prospective attendees were polled for their priority interests, it might be possible to schedule workshops in the half-dozen most popular subjects, and make the conference more meaningful for everyone and useful for cryonics as a movement; it should also help attract more attendees. You, reading this article: why don't you let Alcor know what would be useful for you next time?

It was a feast for the soul (if I may use the word) to attend the Festival! My optimism about humanity, the future, cryonics, etc., was justified and strengthened.

Thank you all! See you next time!

RIGHT-TO-DIE LEGISLATION

... and how it affects cryonics

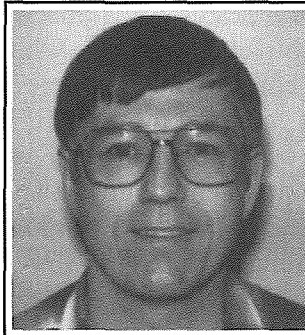
By David Brandt-Erichsen

One of our biggest worries as cryonicists is how to die (deanimate) under the right circumstances. Ideally, when our time comes we want to have the cryonics standby team waiting at the bedside ready to institute the proper procedures immediately. Otherwise, we begin to undergo ischemic damage to our brains as soon as

circulation stops, and this damage becomes worse with time.

If we deanimate suddenly and unexpectedly, there is often little we can do. But the majority of deaths are more-or-less expected, and we or our families will know that we are terminal for days or weeks before actual deanimation occurs. Historically, we have had to wait for deani-

mation to occur "naturally," where we have little control over the situation. During this wait, our bodies and brains can become further debilitated, and we can suffer needlessly. This is especially serious for a cryonicist if one is dying of a condition that causes deterioration of the brain. Suicide, although legal in all states, has not been an option for cryonicists because it has made us subject to autopsy (for this reason cryonicists cannot go to Dr. Kevorkian either). Suicide has also not been something that could be done with a cryonics team standing by because it would have put them in legal jeopardy as "assisting" a suicide. The only option a cryonicist has had available to hasten his or her deanimation was through self-starvation



David Brandt-Erichsen (davidbe@azstarnet.com) did research in molecular biology for twelve years (making "designer genes"). He is an Alcor Suspension Member and is Secretary of the National Space Society (formerly L-5 Society). He is also Secretary of the Natural Arch and Bridge Society and often leads hiking trips into the canyon country of the Colorado Plateau. He would like to come back and catalog the natural arches on Mars.

and/or dehydration. This process takes considerable time, leads to emaciation, and can cause some brain damage as well. This was the chosen course of action taken by Arlene Fried before her suspension in 1990 (an account of this is given in *Cryonics*, December, 1990, pp. 16-21).

Often the last days or weeks of life are accompanied by severe disability or suffering that many people would rather not put up with were they given the choice. It is sometimes said that we have treated dying dogs better than dying humans because we don't let dogs suffer needlessly. But "putting a dog to sleep" and "putting a human to sleep" have an important difference: the dog is not a free agent of choice in the situation. Ironically, until recently the law has not allowed humans to be free agents of choice in the situation either. Recent laws and court decisions are changing this, however, and the right of terminally-ill people to seek physician-assisted suicide is rapidly becoming established. It is quite possible that we will see the first cryonic suspension under controlled circumstances in the not-too-distant future.

The Ninth Circuit Court Ruling

On March 6, 1996, the Ninth Circuit Court of Appeals ruled that it is unconstitutional for any law to prohibit a physician from prescribing life-ending medication for use by terminally ill, competent adults who wish to hasten their own deaths. As of that date, such physician-assisted suicide became legal in all states within the Ninth District: Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and Washington. The Court ruling also stated:

We would add that those whose services are essential to help the terminally ill patient

obtain and take that medication and who act under the supervision or direction of a physician are necessarily covered by our ruling. That includes the pharmacist who fills the prescription; the health care worker who facilitates the process; the family member or loved one who opens the bottle, places the pills in the patient's hand, advises him how many pills to take, and provides the necessary tea, water or other liquids; or the persons who help the patient to his death bed and provide the love and comfort so essential to a peaceful death.

The Court was ruling on a Washington state law which stated "a person is guilty of promoting a suicide when he knowingly causes or aids another person to attempt suicide" (emphasis added). The Court ruled that the "or aids" provision was unconstitutional, but only "as applied to the prescription of life-ending medication for use by terminally ill, competent adults." This upheld a ruling issued in May, 1994 by U.S. District Court Judge Barbara Rothstein, who had declared the Washington law unconstitutional but did not grant an injunction against the law so it remained in effect pending appeal. Rothstein's decision was later overturned by a three-member panel of the Ninth Circuit Court of Appeals, by a vote of 2 to 1. In a rare move, the entire eleven-member panel of the Ninth Circuit agreed to reconsider the case. Its final decision upholding Rothstein was by a vote of 8 to 3.

Rothstein's decision was based on two U.S. Supreme Court cases. The first of these, from 1992, was *Planned Parenthood v. Casey*, which upheld the right to abortion. Rothstein concluded that "the suffering of a terminally ill person cannot be deemed any less intimate or personal,

or any less deserving of protection from unwarranted governmental influence, than that of a pregnant woman." The second case, from 1990, was *Cruzan v. Director, Missouri Dept. of Health*, which upheld the right to refuse unwanted life-sustaining medical treatment. Rothstein concluded that "from a constitutional perspective" a distinction cannot be drawn "between refusing life-sustaining medical treatment and physician-assisted suicide by an uncoerced, mentally competent, terminally ill adult." The Ninth Circuit decision referred to Rothstein's ruling as "an extremely thoughtful opinion" and upheld her interpretation of these two Supreme Court cases. The Ninth Circuit wrote that "*Casey* and *Cruzan* provide persuasive evidence that the Constitution encompasses a due process liberty interest in controlling the time and manner of one's death; that there is, in short, a constitutionally recognized 'right to die'."

The Ninth Circuit ruling also stated that "state laws or regulations governing physician-assisted suicide are both necessary and desirable to ensure against errors and abuse, and to protect legitimate state interests," citing Oregon's Death with Dignity Act as an example (see below). Examples of appropriate regulations cited were the requirement of witnesses to ensure voluntariness, reasonable but short waiting periods to prevent rash decisions, a second medical opinion to confirm terminal status, psychological examinations to ensure that the patient is not suffering from momentary or treatable depression, and appropriate reporting procedures.

The Ninth Circuit Court decision is over 100 pages long. The concluding paragraph is quoted from here:

...by permitting the individual to exercise the right to

choose we are following the constitutional mandate to take such decisions out of the hands of the government, both state and federal, and to put them where they rightly belong, in the hands of the people.... The Constitution and the courts stand as a bulwark between individual freedom and arbitrary and intrusive governmental power...[and] neither the state nor the majority of the people in a state can impose its will upon the individual in a matter so highly "central to personal dignity and autonomy" (Casey).... Those who believe strongly that death must come without physician assistance are free to follow that creed, be they doctors or patients. They are not free, however, to force their views, their religious convictions, or their philosophies on all the other members of a democratic society, and to compel those whose values differ with theirs to die painful, protracted, and agonizing deaths.

Can the Ninth Circuit decision be overturned? On March 25, the Attorney General of the State of Washington filed an appeal to the U.S. Supreme Court. During this appeal, the ruling of the Ninth Circuit will remain in effect unless the Supreme Court issues a stay against the ruling (a rare event). It is not known at the time of this writing if the Supreme Court will agree to hear the case.

The Second Circuit Court Ruling

On April 2, the Second Circuit Court of Appeals held that "physicians who are willing to do so may prescribe drugs to be self-administered by mentally competent patients who seek to end their lives during the final stages of a terminal illness." In a unanimous decision, a three-

judge panel overturned a lower court ruling and struck down two New York laws banning assisted suicide, but only as regards to the conditions referred to above. The ruling makes this practice legal in New York, Connecticut, and Vermont.

The reference to the "final stages" of a terminal illness makes this decision a bit more narrowly defined than the Ninth Circuit decision. The Court did not define this precisely, stating that "the plaintiffs seek to hasten death only where a patient is in the 'final stages' of 'terminal illness,' and it seems certain that physicians would agree on when this condition occurs." The Court also stated that the state was free to "define that stage of illness with greater particularity." The Court made no mention of persons who are peripherally involved (such as placing pills in the patient's hands or providing the necessary liquids, as was mentioned in the Ninth Circuit ruling).

The Second Circuit did say that the state could establish rules and procedures to assure that all choices are free of pressure "upon the elderly and infirm to consent to death," could require the opinion of more than one physician, and could "impose any other obligation upon patients and physicians who collaborate in hastening death." It elaborated on this in a footnote:

For example, the state might take steps to assure the competence of prescribing physicians by imposing education and training qualifications, including pain management; it may require the establishment of local ethics committees as resources for physicians faced with questions relating to requests for lethal medications; it could specify the information to be furnished to the patient to as-

certain that the patient's choice is a fully voluntary one; it might require consultations with other physicians for further diagnosis and prognosis in regard to the patient's illness, for psychiatric evaluation, and for evaluation of pain control possibilities; it may provide a time delay between a request for lethal medication and the prescription in order to allow a time for reflection; and it may suggest some sort of notification to the patient's family.

The Second Circuit ruling was made on different constitutional grounds than the Ninth Circuit ruling. The Ninth Circuit based their decision on the Due Process clause of the Fourteenth Amendment, and specifically declined to rule on the Equal Protection clause because the first ruling was sufficient to resolve the case. The Second Circuit ruled that the Due Process clause was insufficient to grant the right of physician-assisted suicide, but the Equal Protection clause did grant such a right. The Court stated that "New York does not treat similarly circumstanced persons alike: those in the final stages of terminal illness who are on life-support systems are allowed to hasten their deaths by directing the removal of such systems; but those who are similarly situated, except for the previous attachment of life-sustaining equipment, are not allowed to hasten death by self-administering prescribed drugs." Such unequal treatment can only be justified by a compelling state interest, but, the Court stated, "what business is it of the state to require the continuation of agony when the result is imminent and inevitable?"

After the Second Circuit ruling was released, the New York Attorney General immediately announced an intention to appeal the decision to the Supreme Court. At this time

it is not known whether the Supreme Court will agree to hear the case.

Oregon Measure 16

Another major landmark in the right-to-die movement occurred on November 8, 1994, when Oregon voters approved Measure 16: The Oregon Death with Dignity Act. This is the first law in the United States that would grant terminally ill adults the right to obtain a prescription for a lethal medication and thus obtain control over the timing of their deaths. As of this writing, the measure is still held up in the courts and has not taken effect. It is possible that it could take effect by the time you read these words, and it is also possible it could be delayed until heard by the Supreme Court.

The provisions of Measure 16 serve as a model for the rest of the country. The Oregon Death with Dignity Act would allow a person to obtain a lethal prescription provided the following criteria are met: (1) the person must be an adult of at least 18 years of age; (2) the person must be diagnosed by two physicians as being terminally ill with no more than six months of life remaining; (3) the person must be mentally capable of making an informed decision at the time the request is made (a power of attorney cannot be used); (4) the person must make the request both orally and in writing, and the prescription cannot be issued until 15 days after the initial request; (5) the person must be physically able to administer the lethal medication himself (no one else may do it); and (6) the person must be a resident of Oregon.

The last point bears further discussion. One issue is that the measure itself does not define what constitutes a "resident" of Oregon, and there are different residency requirements for different things (the requirements for college tuition and for

voting are different, for example). The residency requirement for voting in Oregon is thirty days. Clarifying whether or not the residency requirement for voting would be the same as for the Death with Dignity Act was a matter that was put on hold while the Act was still being heard in the courts. Another issue is that the Ninth Circuit ruling has legalized physician-assisted suicide in several other states, and there is no residency requirement associated with this ruling. A third issue is that such residency requirements are probably unconstitutional now that the "right to die" has been upheld as a constitutional right. The Supreme Court, in *Doe v. Bolton* (1973), struck down a Georgia residency requirement for abortion. The Court wrote that "a contrary holding would mean that a State could limit to its own residents the general medical care available within its borders. This we could not approve." However, if a state law had a residency requirement, it is unlikely that physicians would try to buck that requirement if they had to face defending their constitutional rights in court in order to do so.

Other provisions of Oregon Measure 16 are: (1) Actions taken in accordance with Measure 16 do not constitute either suicide, assisted suicide, or homicide. (2) Insurance companies are specifically precluded from denying claims on the basis that such an act would be suicide. (3) Anyone present when a person takes a prescribed lethal medication is specifically excluded from any civil or criminal liability (this provision would offer protection to a cryonics standby team). (4) If the physician suspects that a patient might have a psychological disorder or depression causing impaired judgment, a licensed psychologist or psychiatrist must determine that this is not the case before lethal medication can be prescribed.

Immediately after passage, Oregon Measure 16 was challenged in the courts by an attorney from the National Right to Life Committee, and the case was heard before U.S. District Judge Michael Hogan (a Roman Catholic). Judge Hogan prevented the measure from going into effect by issuing both a preliminary injunction on December 27 (the last day before the measure was to take effect) and a permanent injunction in August of 1995, which declared the measure unconstitutional. The case was then appealed to the Ninth Circuit Court by the ACLU, the State of Oregon, and Oregon Death with Dignity. As of this writing, the hearing for that appeal has not been set, but the March 6 ruling of the Ninth Circuit referred to above stated that "Judge Hogan clearly erred" and his finding "is directly contrary to our holding." This certainly gives an indication on how the Ninth Circuit would be likely to rule. Supporters of Measure 16 have filed a motion asking Judge Hogan to lift the injunction in light of the Ninth Circuit ruling. A hearing on this is scheduled for April 24, while this article is in press. If he does not lift the injunction, it may be many months before Measure 16 becomes law. Opponents will likely attempt to appeal the question to the Supreme Court.

The Arizona Aid in Dying Bill

Since the passage of Measure 16, similar legislation has been introduced in over a dozen states, including Alcor's home state of Arizona. As a Board member of the Hemlock Society of Southern Arizona, which was the primary force behind this bill, I played a small role in this. Senate Bill 1007, Aid in Dying, was introduced into the Arizona legislature in December, 1995. It had two significant differences from the Oregon measure: (1) it allowed another person (but not a physician) to ad-

minister the lethal medication if the person was physically unable to do so, and (2) it had a residency requirement of 90 days. I personally lobbied the drafters of the bill to eliminate that last requirement, but was unsuccessful. Their concern was that doing so would make the bill harder to pass.

Nobody thought the Aid in Dying Bill would even reach committee on the first attempt, but on January 16th a hearing was scheduled before the Senate Health Committee. I jumped at the chance to testify:

I drove up [to Phoenix] from Tucson today to speak out in favor of individual liberty. That is the central issue here. Personally, I don't think it should be your decision what the circumstances of my death should be. That should be my decision and my decision alone. This is a fundamental right that should not be up to the legislature, the voters, the Medical Association, or anyone else but ourselves. Nevertheless, it is in fact up to you today, and you have the power to grant us our freedom of choice.

At the conclusion of the hearing, the Committee voted 6-2 to kill the bill. But proponents promised to keep coming back until things change, and another bill will be introduced next year. Since the Ninth Circuit has legalized physician-assisted suicide in Arizona, next year's bill will likely be a bit more liberal in its scope. And armed with new legal arguments, I think I stand a better chance of getting the residency requirement dropped from the bill before it is introduced.

Australia

Another milestone in the right-to-die movement came in May, 1995 when the legislature of the Northern

Territory of Australia became the first legislative body in the world to pass a bill, the Rights of the Terminally Ill Act, which would legalize physician-assisted suicide. As of this writing, no specific date has been set for the new law to take effect, but it is expected to go into effect by August. It was amended in February of 1996 to require that a qualified psychiatrist certify that the patient's decision to seek death is not made on the basis of a treatable clinical depression. The Australia law has three other differences from Oregon Measure 16: a physician may administer the lethal medication, there is no six-month limit on the definition of "terminal," and there is no residency requirement. It seems clear that any resident of Australia may travel to the Northern Territory to obtain aid in dying once the law takes effect. It is not entirely clear if a foreigner may do so, but for a terminally ill person to obtain the necessary visa, even if allowed, would be quite impractical.

The Northern Territory is a barren, sparsely populated region far from Australia's population centers, and much of it is part of the Outback. It includes the famous Ayers Rock and the town of Alice Springs (population 23,000). Everything else consists of small towns except for the capitol city of Darwin on the northern coast, with a population of 76,000. There are reportedly only three psychiatrists in the Northern Territory, all in Darwin, so one would have to go to Darwin to obtain the necessary permission slip. At least eleven people are known to have traveled to Darwin seeking aid in dying without being aware that the law had not taken effect. One of these was a 70 year old retired university lecturer from Sydney who had terminal bowel cancer. She ended up killing herself in her hotel room with a drug overdose.

It appears unlikely that Australian cryonicists have sufficient resources at this time to attempt to set up for a cryonics standby in Darwin. The obstacles to doing so are many. Attempts are being made to pass similar legislation in other Australian states, which are receiving the same sort of opposition as found in the United States. South Australia rejected a similar bill shortly after the bill passed in the Northern Territory.

Some Conclusions

The two Circuit Court rulings and laws like Oregon Measure 16 are a very significant step forward, but they do not address all the issues that need addressing. What about people who are too sick to administer their own medications, or who are hopelessly ill but not terminal within six months, or who become incompetent? The original draft of the failed California Death with Dignity initiative (a draft which never reached the ballot) was far superior to Measure 16. Among other things, it allowed one to choose aid in dying via a power of attorney. There seems to be no prospect for such a provision to be implemented anywhere any time soon. Provisions like this were dropped to appease opposition arguments about adequate safeguards and to try to increase the chances of passing. Measure 16 is a watered-down version of this original draft.

Another legislative model has been published by a panel of legal and medical scholars in an article entitled "A Model State Act to Authorize and Regulate Physician-Assisted Suicide" in the *Harvard Journal on Legislation* (Vol. 33:1, January, 1996). The primary difference between this model and Measure 16 is that this one also allows aid in dying for persons with "intractable and unbearable illness," defined as "a

Concluded on page 23

Toward a Measure of Ischemic Exposure

by Michael Perry, Ph.D.

An ever-present unknown in cryonics is the quality of a suspension. Until more is known, in fact, we will have no good assessment of suspension quality in terms of what we'd really like to know: how well memory and other identity-critical elements are preserved in the frozen remains. Meanwhile we are interested in whatever reasonable indicators of suspension quality it may be feasible to compute, though acknowledging these are imperfect.

One such possible indicator would be a "measure of ischemic exposure" (MIX) intended to assess the amount of high-temperature exposure the patient experiences, mainly in the early stages of a suspension before freezing occurs. Basically, the MIX would tally up how long, in hours say, the patient has been at a given temperature, with a heavier weighting used for higher temperatures, since more damage is occurring at these temperatures. According to a rule of thumb in wide use, each increase of 10°C is supposed to double the amount of damaging activity. At least this is considered roughly accurate—though it must not be pressed very far. Here I adopt this "exponential rule," with the understanding that it is only a starting point.

So, if we normalize our measure so that a MIX of 1 corresponds to 1 hour at 0°C, then the MIX for 1 hour at 10°C would be 2, and for 1 hour at

20°C, 4, etc. The MIX for a fixed temperature would also scale linearly with time—twice as much exposure at a given temperature would give twice as much expected damage, consequently, twice as big a contribution to the MIX. 2 hours at 0°C, then, would yield a MIX of 2. At 10°C, however, in view of the exponential rule, 1 hour exposure would give a MIX of 2, and 2 hours a MIX of 4. In general, for t hours at a constant temperature T the MIX would work out to

$$\text{MIX} = 2^{T/10}t.$$

More generally still, temperature will not be constant but a function of time, $T(t)$. For this case, we must integrate the expression $2^{T(t)/10}$ over the time interval involved to obtain the MIX. For a suspension extending from time t_0 to t_1 , then, the MIX is given by

$$\text{MIX} = \int_{t_0}^{t_1} 2^{T(t)/10} dt$$

In particular, the MIX has a simple form for the special case of a constant cooling rate, say r degrees per minute, starting at body temperature or 37°C. For a cooldown from 37 to 0°C the MIX works out to $2.88/r$. For a typical "good" suspension today, r might be around 0.25 (15 degrees per hour, or about 2½ hours for the cooldown to 0), giving a MIX around 14. The cooldown doesn't stop there, of course, nor does the

damage from high (if now subfreezing) temperature. (And I've oversimplified the cooldown here; it usually proceeds fairly rapidly down to maybe 2 or 3°C, then is put on hold for up to several hours so washout and perfusion can take place.)

Suppose the same rationale for estimating temperature damage is in effect for temperatures *below* the freezing point—this is increasingly unrealistic as we drop lower in temperature but perhaps not too far off near 0, where the effect on the MIX would be greatest. We can then estimate the contribution to the MIX that would be made for a further segment of the cooldown. (Whatever it is, this contribution must of course be added to the value obtained for the above-zero temperatures to obtain the total MIX.) Suppose we cool from 0 to -78°C (dry ice temperature) at a constant rate of s degrees per hour. Using the second equation we obtain a MIX contribution of $14.4/s$. For a fairly typical value of around 3 degrees per hour this would be around 5, giving a total MIX around 20, equivalent to 20 hours at 0°C.

It is hardly necessary to add that these ideas need refinement. In particular the exponential rule is too simplistic. However I think the above could be a starting point to one useful indicator of suspension quality.

I thank Hugh Hixon for consultation in writing this article.



Cryonics Will Not Go Away

One issue which keeps arising in discussions of cryonics is that of whether the people of the future will revive us. Such a question need not assume that people of the future continue to age and die as human beings do now; it does, however, seem to assume that at some time our technology will advance so far that we will no longer *need* cryonics. Certainly we can envision a day when every currently known disease (including aging) can be and has been cured and its damage totally reversed. So how could we (or the people of that time) still need cryonics? And why, then, would they bother to revive all those ancient people suspended in the 20th and early 21st centuries?

As someone who believes that *some* form of cryonics will be with us into the indefinite future, I believe that there is a very easy answer. In the broadest sense cryonics will *not* go away, because there will always be *something* which can go badly wrong. Of course our technology will become orders of magnitude more powerful than anything we can imagine today; yet it will always fail to deal with events on its edges, wherever those edges might be. It will have edges: problems it cannot

solve, simply because no matter how powerful it will always remain *finite*.

I do not claim to be able to say what those problems might be, since I can hardly predict the technology of 1000 years in the future. Anyone claiming to do so could only be overcome with hubris. I can, however, point to the past and even the present: accidents have *always* happened. After we learned about x-rays, we needed some time to realize how dangerous they could be. The earliest steam engines had a distressing tendency to blow up. No one had been electrocuted until we understood enough about electricity to make that possible. As for the present, we learned only a few years ago that the antibiotics of which medicine was once so proud had become useless because their targets had developed resistance to them. We haven't yet had an accident in genetic engineering, but it is certain that one will soon happen. How such things happen, in detail, depends on the devices and our understanding; yet we can take it as a certainty that hypertechnological devices will lead to hypertechnological accidents.

I do not expect to be revived by some faceless person who just happens to think reviving me would be

a fun thing to do. I expect to be revived by those who belong to a descendant of my cryonics society. They will revive me because if they did not, they would cast doubt on their own future revival when they too someday got into serious trouble. What kinds of trouble that might be we will learn after our revival, but there will be troubles of one kind or another.

Nor does this pact between times require any specific technology. Someday suspension patients may be stored out past Neptune, where it is naturally the right temperature. Or someday the method of storage will become something quite different, a highly evolved embalming. Or some method of storing the *damaged* person in a computer (if one of your disks somehow gets trashed today, and the information on it is important enough, you may save it in the hope that someone will come up with a program able to read it. . . in fact, some people specialize in doing that even today). I would expect that storage to take many forms over time, some of which no one has yet imagined. It is not really the method which is important, but the social compact.

If we want to live indefinitely

long (or forever, not to put too fine a point on it), then we'll have to understand that the probability of suffering some kind of accident from which the technology of the day cannot recover you will *never* go to zero. Not only that, but someone who expects to live for 600 years, as will all his or her friends, will not be happy to discover that due to such an accident their life may be shortened to only 400; and when someday we can multiply those numbers by 10 or 100, that unhappiness will remain. When I was a child of six, I thought that a year was a very long time. We adjust our ambitions for ourselves to the time we think we will have.

Right now, it is essential, and not just a side issue, that cryonics societies do whatever they can to support and promote research leading to revival. It is that support which shows that they are serious about their goal and will carry it out when they can. And when we do learn how to revive some suspension patients,

the cryonics societies of *that* time will find that reviving those patients is also essential, because it once more demonstrates that they fulfill their promises whenever they can.

In some ways cryonics societies are like life insurance companies: they too were very hard to get started, and for a long time few people would join. . . for the good reason that buying a life insurance policy requires that the buyer trust the seller to pay up, though that payment may be decades in the future. And the best proof that the insurance company would pay up consists of it actually paying up for others, and that this be seen by possible customers. We cannot yet revive people, but we can demonstrate our aim to do so by serious work on the problem. When we can revive people, we will find that we *must*, or lose all the trust which we have built up before then.

And note: those who want to see someone revived before they join *do* fail to understand our (and their!)

current situation. Yet their wish can come not just from skepticism about the technology, but skepticism of the cryonics societies themselves; of whether we can really be trusted with anything so precious as their lives. We must *earn* that trust, we cannot assume it. And sadly, that will cost some people their lives.

Many estimates exist of how long we might live if we did not age. One common suggestion is 600 years. Cryonics is one of the main tools we can use to attain far greater longevity. It is not just a means to get to a wonderful future (not that the future will not be wonderful), but a means to survive even the accidents which may happen to us after 600 years, or 6000, or 60000.



Continued from page 20

bodily disorder that cannot be cured or successfully palliated, and that causes such severe suffering that a patient prefers death.”

Assuming that the two Circuit Court rulings remain in effect, legislatures will increasingly be looking at such models as a way of implementing and regulating the rights mandated in the rulings. As this is being written, physician-assisted suicide is legal in twelve states, but none of those states have any regulations to govern the process (Oregon may become the first if Measure 16 goes into effect). It is also unknown at this time whether or not the issue will go to the Supreme Court. Therefore, those who wish to exercise their

rights under the Circuit Court rulings face an uncertain legal environment. At the very least, such persons should follow the guidelines in Measure 16 to avoid criticisms that adequate safeguards were not followed. Trying to do a cryonic suspension under controlled circumstances in such an uncertain legal environment would be a risky endeavor, incurring the risk of large legal expenses and possibly even autopsy. Although courts and legislatures grind slowly, change is coming. There is now considerable hope that we will see the first cryonic suspension under controlled circumstances within the foreseeable future.

[Copies of the two Circuit Court rulings and Oregon Measure 16 can be obtained on the world wide web

at <http://www.rights.org/deathnet/ergo.html>. A copy of the Australian law can be obtained at <http://www.nt.gov.au/lant/>.]

A footnote from Steve Bridge:

Alcor is following this issue closely; but any such "assisted suicide" for cryonic suspension will only be performed after proper legal protection has been assured. The first assisted suicide suspension will probably require a great deal of legal expense in attorney fees for documents and court hearings. We will be very careful in this, so we do not endanger Alcor's security and, thus, the security of the patients already in suspension.

INFECTIOUS DISEASE:

A Long Way From Defeat

Book Reviews by Stephen Bridge

Perhaps you're sitting there in your comfortable chair reading this magazine, and you're feeling pretty good about your future. You've got your cryonic suspension arrangements as a back-up; but you figure you're unlikely ever to need it. Immortality is just around the corner. You expect anti-aging drugs, vitamins, genetic advances, and eventually nanotechnology and artificial intelligence to prevent you from ever dying. You do all the right things to prevent cancer and heart disease, and since you can't imagine any other way you would ever die (barring the rare steamroller accident), you've got it made.

Sure, you know you're ignoring infectious diseases, but hey, doctors pretty much whipped them in the 1950's with antibiotics and vaccinations. Oh sure, there's that HIV thing, a bit messy perhaps; but you're not gay and you don't shoot drugs or live in Africa; so who cares, right?

Wrong; fatally wrong.

Just as a start, AIDS is now a world-wide plague, expected to cause perhaps 10 million deaths in the next 10 years. AIDS is now the fourth most devastating epidemic in human history, catching up to the great in-

fluenza epidemic that killed 20 million people in 1918, though not yet in the same league as several immense smallpox epidemics (a disease which was still killing as many as 2 million people a year as late as 1958) and the bubonic plague ("the Black Plague") that killed one third of the population of China and Europe between 1346 and 1350.

For many years Americans and Europeans thought of AIDS as a disease only of male homosexuals and drug-users, since those were the population groups which were first infected. However, in Africa and the Far East, AIDS is primarily a *heterosexual* disease. Even in the U.S., women are the fastest growing population for new HIV infections. We are nowhere near an ability to cure AIDS—and HIV is not even close to the most dangerous disease organism lurking out there.

Ebola. Lassa. Marburg. These names throw terror into the hearts of medical researchers and they should into yours as well. They are part of a class of *filoviruses*, named for their filament-like shape. They are also called "hemorrhagic" viruses, for their effects on humans. The effects

are more important than the shape. These primitive pieces of RNA rapidly cause the cells of the infected person to dissolve, beginning with the connective tissue in the body, then typically the intestines, the testicles, the stomach and other internal organs, the lining of the lungs, the muscles, and the brain. Blood pours from every orifice of the victim, each drop containing a hundred million highly infectious virus particles. Within seven to ten days after infection, the victim's insides tear open and he bleeds out and dies. Ebola Zaire, the most deadly strain, is at least 90% fatal. There is no treatment, no cure, and no vaccine.

The only factors that prevent these diseases from wiping out the human race are that they are confined to the rain forests of Central Africa, that they are only spread by sexual contact or contact with the blood of an infected person, and that they kill people so fast that the disease can't spread much beyond the local village.

At least that *used* to be the prevailing wisdom. Two recent books tell quite a different story.

* * *

The Hot Zone, by Richard Preston.
Random House, 1994.

In November, 1989, there was nearly an Ebola virus outbreak in Reston, Virginia, a suburb of Washington, DC. A group of crab-eating monkeys had been imported from the Philippines and was being held in a quarantine facility for thirty days to be watched for infectious disease. As they began dying in large numbers, personnel from the nearby United States Army Medical Research Institute of Infectious Diseases (USAMRIID) discovered the monkeys tested positive for the Ebola Zaire virus. Not only that, the virus appeared to be communicated from room to room through the ventilation system. An airborne version of Ebola in a densely populated U.S. city (and next door to a day-care center)? To the credit of those involved, it didn't take long to develop a response.

The Army and the Centers for Disease Control organized a military operation to seal the building, safely destroy the monkeys, and completely sterilize every inch of the inside. Four of the monkeys' human caretakers tested positive for Ebola, but oddly never became ill. Further testing showed that this was a slightly different strain of Ebola, varying from the deadly Zaire strain by only a few molecules, just enough to be fatal to the monkeys but not to humans.

But what if that had been a strain that killed humans? What kind of devastation could be caused in America by an airborne version of a disease that is 90% fatal and literally dissolves its victims in a few days?

Preston's book is terrifyingly personal in its interviews with the men and women involved in the discov-

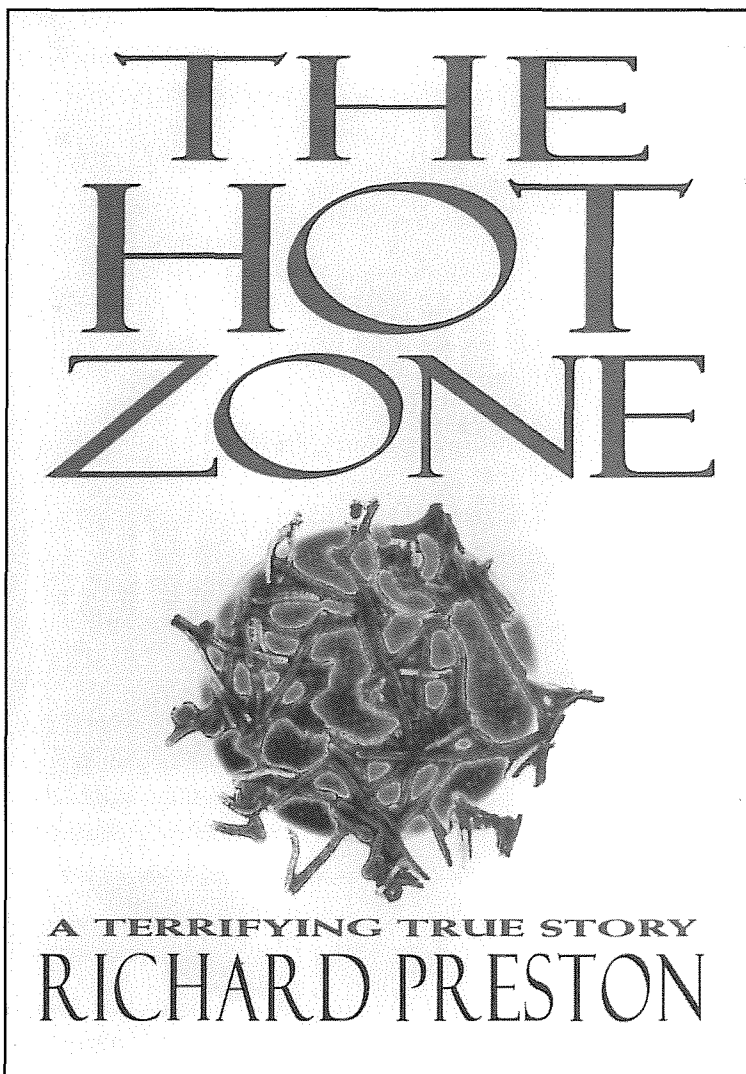
er's victims of the Marburg virus (just as nasty, but fatal "only" about one-fourth of the time) and the Ebola virus. Preston even visited Africa to see the amazing Kitum Cave, where two of the early Marburg victims *might* have contracted the disease (no one has ever discovered the animal hosts for any of the African hemorrhagic viruses).

Preston notes AIDS, Ebola, and other diseases are emerging from the parts of the world being damaged by humans. He believes that the "paving of the Kinshasa Highway [the main east-west road across Central Africa and the primary route for the initial spread of HIV] affected every person on earth, and turned out to be one of the most important events of the twentieth century. It has already cost at least ten million lives, with the likelihood that the ultimate number of human casualties will vastly exceed the deaths in the Second World War."

A combination of environmental destruction and war, which force people and animals to move to new areas—with their diseases—and better transportation,

which lets the people and animals move all over the world, has resulted in each of us being at risk from new pathogens. Think of that the next time you are on an airplane. Where have the other passengers been in the past week? And what passengers are riding in *them*?

In many ways, *The Hot Zone* was the most frightening book I had ever read—until I read the one below.



ery and clean-up of the Reston facility. The book is compelling reading in its depiction of human beings battling against an unknown monster that cannot be seen. But this is more frightening than any horror novel or episode of the *X-Files*, because it is true.

Preston sets up his story well by giving the background of the disease, following the deaths of early African

The Coming Plague; *Newly Emerging Diseases in a World out of Balance* by Laurie Garrett. Farrar, Straus, Giroux, 1994.

Recently I heard an economist state in a radio interview that at least 100 million people had moved across national borders during the last ten years—not even counting armies, tourists, and temporary workers. Most of these people were driven from their original homes by poverty, starvation, and war. They carried with them the diseases of their homelands, to which they had often developed some level of immunity, but which were unknown to their new neighbors.

When I saw that Garrett's book was titled "The Coming Plague," I suspected she was indulging in media hyperbole. She was not; if anything, the title is actually *understated*. Garrett's mission in this book is to detail all of the world epidemics since 1962 and show how we are losing the war against the microbes. It takes more than 700 pages for her to do so, but the approach is highly effective.

Garrett begins with the little known story of the devastation caused by the *Machupo* virus in the San Joaquin region of Bolivia. This was a hemorrhagic virus similar to Lassa and Ebola which killed between 10 and 20% of the population of the area between 1962 and 1964. Several

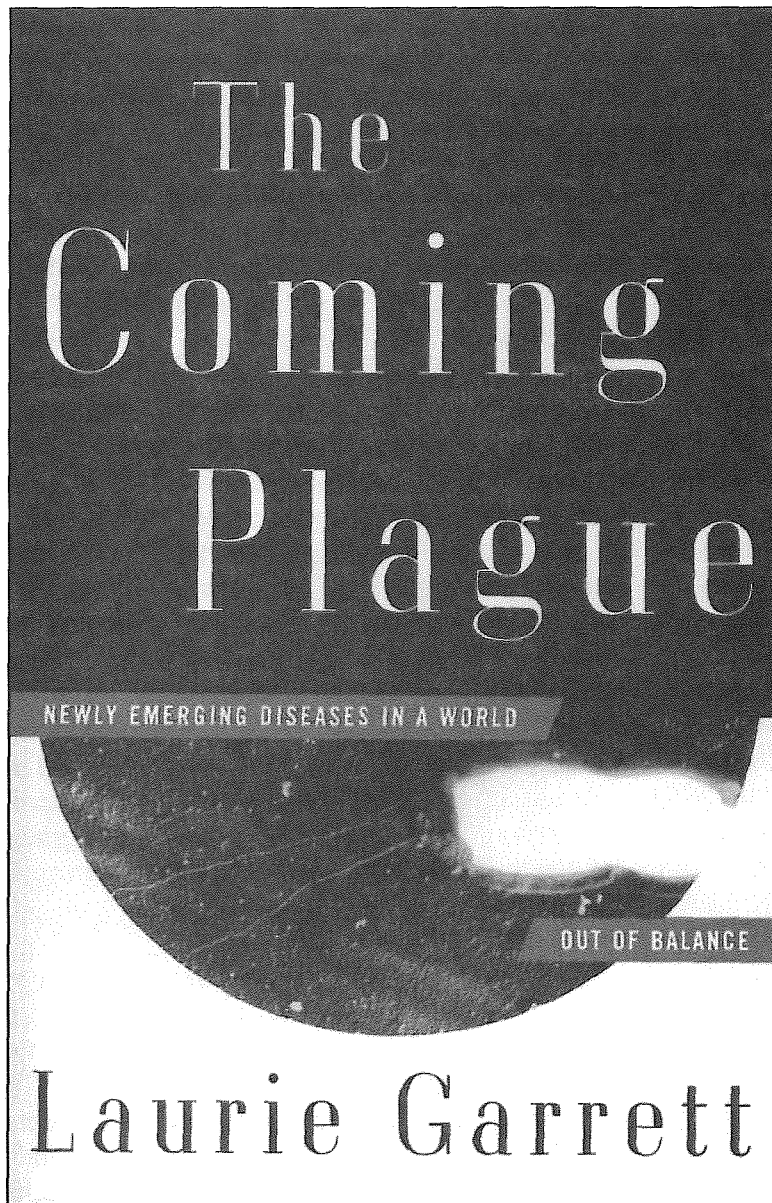
bright and brave researchers from the National Institutes of Health isolated the virus, found the animal host (a mouse), and brought the epidemic to a halt. Perhaps this incident would remain a tiny footnote in medical history if not for the other hemorrhagic viruses and odd infections that were discovered over the next three

mense number of facts and figures presented in this deeply researched work. There are many heroes like Karl Johnson, Joe McDade, Don Francis, Joe McCormick, Ron MacKenzie, and hundreds of others. Garrett describes the detective work and medical battles against the hemorrhagic viruses, AIDS, Hanta viruses, swine flu, Legionnaires' Disease, dengue fever, new versions of malaria and yellow fever, tuberculosis, cholera, even the panic over Toxic Shock Syndrome and tampons.

After a while, the descriptions of the different outbreaks and epidemics begin to blur and it becomes hard to remember which are which. I believe this is, in some way, part of Garrett's plan. As the deaths and viruses and questions pile up, we begin to understand how infectious disease spreads, how pervasive it is, and how much we do *not* know about it. About halfway through the book, Garrett begins to shift her emphasis to understanding the changes in the world and how both humans and microbes are adapting to them. The human race is ripe for a plague as devastating as anything seen

by medieval Europe. It might be a filovirus; but there are dozens of other invaders on the attack and we humans have thrown open the gates to the castle ourselves.

One of the most frightening chapters is about drug-resistant microbes.



decades. The experience of the scientists in Bolivia would give the entire infectious disease community information and methodology it needed in the later outbreaks.

I could easily overwhelm you with the stories Garrett tells and the im-

Just as one very basic example, *most* malaria parasites in the world are now resistant to chloroquine, once the most effective and inexpensive of antimalarial drugs. Substitute drugs are much more expensive, a serious problem in the subtropical nations where malaria is endemic, and the malaria parasites are already developing resistance to them anyway. In the 1950's, world health officials spoke confidently of eliminating malaria by the end of the century. Yet by 1993 over 500 million people in Africa alone had a severe episode of malaria *each year*, and mortality was at an all-time high.

It is not just Africa, of course. Here in the United States, overuse of antibiotics has created numerous strains of MDR (multiply drug-resistant) staphylococcus, streptococcus, and pneumonia which are killing an increasing number of patients every year. Nasty strains of antibiotic-resistant *E. coli* are showing up in food and can resist killing by chlorine in city water systems. In April, 1993, 400,000 residents of Milwaukee, Wisconsin were infected with the tiny parasite, *Cryptosporidium*, which was resistant to chlorination. In fact, it was later determined that this strain *could live in Clorox bleach*.

One final example: At any given time, from one-third to one-half of the *world's population* is infected with tuberculosis. Only about 10% will develop an active case of the disease; but that is still in the neighborhood of 200 million people. In the United States, a combination of the HIV epidemic and illegal drug use have combined for true large city epidemics of the disease, which are beginning to parallel the TB epidemics of the early part of this century. As many as one-half of the new cases each year are from MDR strains. Typically, these strains evolve when a patient is given medication for his basic, treatable strain of TB, the

course of treatment for which should last for several months. However, in many cases, as soon as the sufferer feels better, he stops taking the medicine. Only the weaker bacteria have been killed and the stronger can grow and mutate to defend themselves against that drug.

Diseases do not just happen to poor people or drug addicts or prostitutes or gay men or African villagers. They may sometimes begin with an outbreak in one of those populations, but they can also start with upper-class white teenagers, middle-aged war veterans, well-off tourists, and big city hospital staff. No matter where diseases begin, they have the potential to get to each and every one of us.

The Coming Plague is a fascinating book in its tales of medical detectives; but also unnerving as the reader begins to understand the implications of the changes occurring in that realm of life invisible to the eye. Garrett is careful to point out that those of us lucky enough to avoid infectious disease cannot escape its effects. Some African and Asian countries are already spending more than half of their GNP on disease prevention and treatment. Many African nations have only been independent for a generation or two, and it is often the educated young people who are getting AIDS as they move around the city and test their new economic and sexual freedoms. As the death rates from AIDS, TB, malaria, etc. grow in these countries to staggering numbers, economic stagnation is certain and total collapse of two decades of progress is possible.

Something to Ponder

In spite of the optimism of many of our younger cryonicists and nanotechnologists, there is a very good chance that we will *not* become immortal in the next several decades. For every way in which we think to

overcome nature or change the earth or redesign ourselves, there is a predator looking for a new source of food or a parasite looking for a new home. These tiny creatures adapt to our drugs and evolve inside our bodies and those of our pets and animal neighbors, perhaps as fast as we can design counter measures, even with nanotech robots at our disposal. *These diseases may even prevent the research needed to develop advanced biotechnologies.* Consider how many billions of dollars already are being spent on AIDS research and the care of AIDS patients. An airborne virus that kills only 10% of its victims could destroy many of our best minds just as effectively as a nuclear war. The attendant costs could make technological developments in any area besides short-term disease control impossible.

You can live your lives in the fantasy that everything will be just fine in the near future. Or you can read these books and be reminded that reality is a lot harder. I'm not trying to ruin your day with doom-and-gloom predictions of the end of civilization. However, we can't overcome the barriers to our long lives and happy futures if we refuse to understand what they really are. Spending a lot of energy on the intricacies of libertarian government, digital cash, and colonies on the moon aren't going to do us much good if several million Americans randomly die each year from new diseases.



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Alcor's Emergency Response capability includes equipment and trained technicians in Arizona, New York, Indiana, Northern California, Southern California, and England, and a cool-down and perfusion facility in Florida. Alcor's Arizona facility includes a full-time staff with employees present 24 hours a day. The facility also has a fully equipped research laboratory, an ambulance for local response, an operating room, and a patient care facility using state-of-the-art storage vessels.

Meetings

Board of Directors Meetings

Alcor business meetings are held on the first Sunday of every other month: January, March, May, July, September, and November. (The July and September meetings are on the second Sunday.) Guests are welcome. Meetings start at 1 PM. For more information, contact Alcor at:

ALCOR
7895 East Acoma Dr., #110
Scottsdale, AZ 85260
(602) 922-9013

Directions: Take the 10 to the 17 Northbound, exit Thunderbird Road heading East. Thunderbird will turn into Cactus St, stay on Cactus until you turn left on Tatum, and then right on Thunderbird (which will turn into Redfield in about 3 miles), then (after a quarter mile on Redfield) left on 76th Place. 76th Place turns into Acoma Drive; Alcor is on the right at 7895 Acoma Dr., Suite 110.

Southern California

The Southern California chapter of Alcor meets every month in an informal setting in one of our member's homes. Meetings are on the fourth Sunday of the month. For more information, call Michael Riskin at (714) 879-3994.

Boston

There is a cryonics discussion group in the Boston area meeting on the second Sunday each month. Further information may be obtained by contacting Tony Reno at (508) 433-5574 (home), (617) 345-2625 (work), 90 Harbor St., Pepperell, MA 01463, or reno@tfn.com (email). Information can also be obtained from David Greenstein at (508) 879-3234 or (617) 323-3338 or 71774.741@compuserve.com (email).

District of Columbia

Life Extension Society, Inc. is a new cryonics and life extension group with members from Washington, D.C., Virginia, and Maryland. Meetings are held monthly. Call Mark Mugler at (703) 534-7277 (home), or write him at 990 N. Powhatan St., Arlington, VA 22205.

Bay Area

Alcor Northern California meetings: Potluck suppers to meet and socialize are held the second Sunday of the month beginning at 6:00 PM. All members and guests are welcome to attend. There is a business meeting before the potluck at 4:00. For meeting information, call Alcor at 1-602-922-9013

England

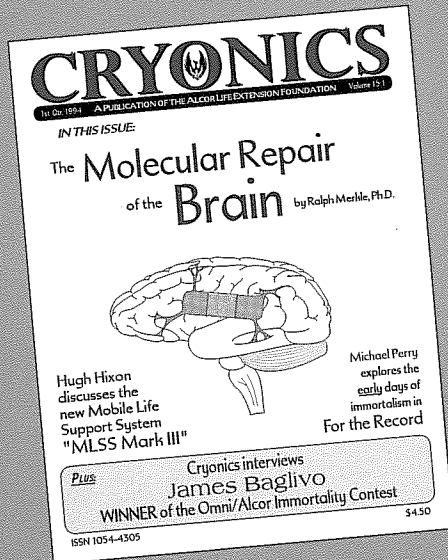
There is an Alcor chapter in England, with a full suspension and laboratory facility south of London. Its members are working aggressively to build a solid emergency response, transport, and suspension capability. Meetings are held on the first Sunday of the month at the Alcor UK facility, and may include classes and tours. The meeting commences at 11:00 A.M., and ends late afternoon. The address of the facility is:

Alcor UK
18 Potts Marsh Estate
Westham
East Sussex
Tel: 01323 460257

Directions: From Victoria Station, catch a train for Pevensey Westham railway station. When you arrive at Pevensey Westham turn left as you leave the station and the road crosses the railway track. Carry on down the road for a couple of hundred yards and Alcor UK is on the trading estate on your right.

People coming for AUK meetings must phone ahead—or else you're on your own, the meeting may have been cancelled, moved, etc., etc. For this information, call Alan Sinclair at 01273 818558. Near metropolitan London, contact Garret Smyth at 0181 789 1045 or Garret@destiny.demon.co.uk, or Mike Price at 0181 845 0203 or price@price.demon.co.uk.

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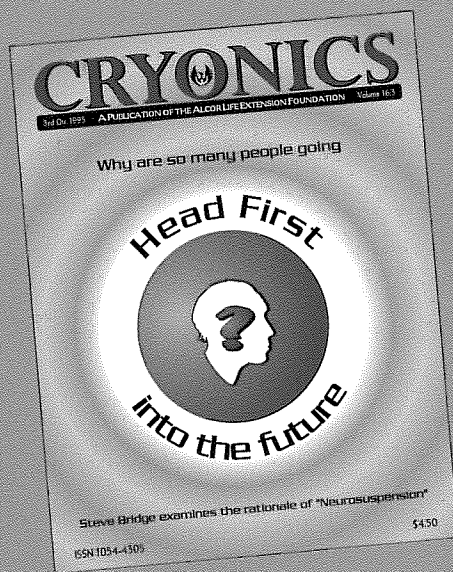


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