

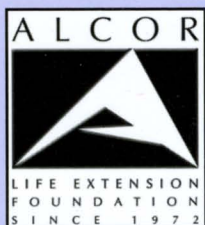
CRYONICS

3rd Qtr. 2002 A PUBLICATION OF THE ALCOR LIFE EXTENSION FOUNDATION Volume 23:3



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Alcor: The Origin of Our Name

In September of 1970 Fred and Linda Chamberlain (the founders of Alcor) were asked to come up with a name for a rescue team for the now-defunct Cryonics Society of California (CSC). In view of our logical destiny (the stars), they searched through star catalogs and books on astronomy, hoping to find a star that could serve as a cryonics acronym. *Alcor*, 80 Ursae Majoris, was just what they had been looking for. It not only had some acronymic "fit" for cryonics but was also symbolic for its historical use as a test for eyesight and was located in a very well known constellation.

Alcor, a companion star of Mizar in the Big Dipper's handle, is approximately 5th magnitude, barely within the threshold of human vision. Additionally, it is quite close to Mizar from an angular standpoint, and dimmer. Only with excellent vision can one tell there are two stars rather than just one. For thousands of years, people in the Middle East have used Alcor as a critical test of visual sensitivity and focus. If you could see Alcor, you had excellent vision indeed. In the early days of cryonics, few people could see the need for a rescue team or even for cryonics itself. Symbolically then, Alcor would be a "test" of vision as regards life extension.

As an acronym, Alcor is a close if not perfect fit with *Allopathic Cryogenic Rescue*. The Chamberlains could have forced a five-word string, but these three seemed sufficient. *Allopathy* (as opposed to *Homeopathy*) is a medical perspective wherein *any treatment that improves the prognosis is valid*. *Cryogenic* preservation is the most powerful method known to halt the rapid, entropic disorganization of people following clinical death. *Rescue* differentiates a cryonics approach from

(yet to be developed) proven suspended animation. The acronymic interpretation of Alcor is therefore *use of a cryogenic procedure, though unproven, to preserve structure and potential viability, since failing to do so allows further disorganization to occur and reduces the probability (prognosis) of reversal and reanimation at any future time*.

Some of these thoughts were presented at a CSC dinner meeting in the autumn of 1970. A number of people who have subsequently become members of the Alcor Life Extension Foundation were present at that gathering. Over the months that followed, it became increasingly evident that the leadership of CSC would not support or even tolerate a rescue team concept. Less than one year after the 1970 dinner meeting, the Chamberlains severed all ties with CSC and incorporated the "Rocky Mountain Cryonics Society" in the State of Washington. The articles and bylaws of this organization specifically provided for "Alcor Members," who were to be the core of rescue team activity. Difficulties in securing nonprofit status in Washington then led to reincorporation in California, this time under the name "Alcor Society for Solid State Hypothermia." In the late 1970s, to further broaden the organization's objectives, the present name (Alcor Life Extension Foundation) was adopted.

Despite many transitions, the symbolism of the name remains. How long will it take for more people to see that "Ashes to ashes and dust to dust" is a meaningless destiny... to see that it is possible to reach for a distant tomorrow and perhaps to attain it... to *see* Alcor for what it really is: a vehicle with which to attempt that fantastic voyage!

—Reprinted from *Cryonics*, August 1984.



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Lisa L. Lock
llock@winterthur.org

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Submissions may be sent via e-mail (jlemler@alcor.org or llock@winterthur.org) in ASCII, Word, or PageMaker format. Mailed submissions should include a PC diskette with the file in any previously mentioned format (although printed text alone will be considered). All submitted media become property of the Alcor Life Extension Foundation unless accompanied by a self-addressed stamped envelope. The Alcor Life Extension Foundation assumes no responsibility for unsolicited manuscripts, photographs, or art. Send all correspondence and submissions to:

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Alcor Life Extension Foundation
7895 E. Acoma Dr., Suite 110
Scottsdale, AZ 85260

Visit us on the Web at www.alcor.org

How to Join Alcor

Your research is finally complete. You browsed our web site (www.alcor.org), presented your questions to our Membership Administrator (jennifer@alcor.org), and toured our facility. Now you are ready to establish your membership with Alcor Foundation. Congratulations and welcome!

Upon receipt of your application for membership and application fee, Alcor will send you various membership documents (samples available upon request). After reviewing these documents, you will need to execute them in the presence of two signing witnesses. Perhaps a representative of your local bank can notarize the single document that also requires this official witness. After returning all of your documents to Alcor for approval, you can expect to receive one original copy of each for your personal records.

Most people use life insurance to fund their suspension, although cash prepayment is also acceptable. If you do not already have an insurance policy, Alcor recommends that you apply for one at your earliest convenience, as the underwriting pro-

cess can last several weeks. Jennifer Chapman, Alcor Membership Administrator, can provide you with a list of insurance agents who have previously written policies for this purpose. These agents can assist you with satisfying Alcor's various funding requirements, such as naming Alcor as the owner and irrevocable beneficiary of your policy and ensuring that your benefit amount is sufficient.

With your membership documents completed and your funding approved by Alcor, you will be issued emergency identification tags engraved with your personal Suspension Number. This is your confirmation that Alcor will provide you with suspension services, should our emergency technicians ever receive a call on your behalf. Certainly, Alcor hopes that you will not need our services anytime soon, but as a member of Alcor you can feel confident that our organization will care for you and your future. Please call 480-905-1906 ext. 113 today to request your application.

TO ALL ALCOR MEMBERS AND THOSE IN THE SIGN-UP PROCESS

Please! Please! Please!

When you move, or change phone numbers (work number as well), change e-mail addresses, or undergo any medical procedure where general anesthesia is used, please inform us as far ahead of time as you can.

Too many times we have tried to contact our members and found out the contact information we have is no longer valid.

Other times we find out well after the fact that a member has undergone a medical procedure with life threatening potential.

*Help us to serve you better!
Keep in touch!*

Write Tight and *Speak Succinctly*



by Natasha Vita-More

When an interviewer gives the go-ahead that the interview has started, you hope to be diplomatic and expert, impassioned and circumspect, proprietorial, yet as generous with ideas and knowledge as possible. The journalist doesn't have to agree with you. She doesn't even have to like what you say. But she is a journalist, after all, and she will always have an inquiring mind. It's part of the job description.

This in itself is especially tricky with topics such as cryonics. Just look at the recent journalistic commentary on Ted Williams. For example, the CNN program "Elizabeth Cohen: Ted Williams Controversy" on July 9, 2002, or the CBS News piece titled "Cryo-Ted Drama Goes to White House" on July 11, 2002, were full of newsworthy hype, although other reports were more interested in facts than fancy. "Putting a Legend on Ice" was the topic of CNN's Crossfire program when journalists Paul Begala and Tucker Carlson tackled the topic of cryonics. This widely viewed CNN program featured Max More, president of Extropy Institute, and Jonathan Moreno, director of the University of Virginia's Center for Bioethics, in what turned out to be a heated debate. Hands down, Max was the winner when he verbally stood up to the derisive journalistic style of Begala and Carlson.

Charlie Rose, one of television's most-sought-after interviewers, appears to interview people that he genuinely has an affinity toward. Is this true, or is Charlie Rose simply highly inquisitive and an excellent listener? What about Walter Goodman, who was known for "glowing" after a heady interview? "Walter had vast knowledge about many, many things, ranging from literature to politics, but was always unassuming. He had his standards, and television news nearly always failed to meet them. Walter wasn't afraid to say so, but he never personalized his criticism. He

never made fun of the blown-dry anchors, but dealt instead with whether the substance of the program passed his test or not. He was certainly powerful. A review praising 60 Minutes was posted all over CBS." (http://www.nytc.com/timestalk/2002_03/wwt/goodman.html)

Goodman's style was different from Rose's. Rose's style is different from Jay Leno's who, in turn, is different from Larry King's. In fact, Goodman publicly stated that Charlie Rose's interview style is "puffy." (www.nytc.com/timestalk/2002_03/wwt/goodman.html). That's not so bad, in light of Connie Chung's puffy "moment" with Marlon Brando. But what about journalists like Oriana Fallaci? Italian and smart, Fallaci's morality has rarely been doubted, although her interviewing techniques are quite controversial.

"According to New York Times Book Review contributor Francine du Plessix Gray, Fallaci combines 'the psychological insight of a great novelist and the irreverence of a bratty [w]hiz kid.' Known for her abrasive interviewing tactics, Fallaci often goads her subjects into revelations. 'Let's talk about war,' she challenged Henry Kissinger in their 1972 interview. 'You're not a pacifist, are you?' When a subject refuses to cooperate, he becomes 'a bastard, a fascist, an idiot,' notes *Esquire* contributor David Sanford." (<http://www.giselle.com/oriana.html>)

Pulitzer prize recipient and noted George Polk Award winner, Studs Turkle, has written about America and the common man. What if he, or someone of his stature, was to write about superlongevity, or specifically nanotechnology, genetic engineering, therapeutic cloning, designer genes, or enhanced intelligence? Having someone of Mr. Turkle's legendary name approach a controversial topic such as cryonics might reveal more about the human and transhumanist nature behind the ideas of defying death and living longer. Or, would his blatant distrust of technology cause him to hold cryonics in disdain?

This is the rub. Whether it is puffy, arrogant, technophobic and blown-dry, or sincere, intuitive, researched, and fair-minded, no one knows for sure what the interview will actually be like

until it is published or televised.

We want cryonics to be covered by journalists of repute. We want to be interviewed by people who can converse with us about ideas about our future without the pessimism that so often prevails in journalism today. While there are some journalists who have shown positive interest in living longer, including Barbara Walters and Larry King, most journalists strive to succeed under the bark of yellow-dog journalism. Those who cover stories and subjects with authentic interest and grit are usually forced by their editors to exaggerate an issue regardless of writing with expertise and skill, knowledge and fairness.

Men and women who hold a sincere interest and involvement in superlongevity and cryonics enjoy talking about their lives and their work. We, as readers and viewers, enjoy reading about these reminiscences. We also share their perspectives on the past and reflect on what the future may hold. At the heart—the core—of each interview are the very ideas that make a difference in our world.

My favorite interview hasn't happened yet. Like most people, I have had some hits and some misses, although, fortunately enough, mostly hits. There is nothing so rewarding than seeing your life's work mentioned in print, to read about something you have accomplished being discussed by experts, or seeing your ideas on the cover of a magazine or newspaper. For all the glory that the media brings to our expressions, there is equally something quite disturbing about how the press has the uncanny ability to twist and turn, edit out of context, and misquote words, phrases, and entire sentences.

This did not occur in my 2000 interview with *La Spirale*, a French e-zine. From the get-go, the journalist got it, clean and simple. I didn't have to appease a cynical mind or tap dance around the topic of cryonics or superlongevity. Yet, not all interviews are so easy. Some are forgotten and some are remembered.

I remember being interviewed by George Kline in the late 1960s. George Kline? He was a friend of Elvis Presley, and he hosted a local Memphis teenage music dance program on television. He was the South's answer to Dick Clark's "American Bandstand," which first aired on the ABC network in August of 1957 and put every musician during the 1950s and 1960s on the map. The interview with Kline was about culture and dance music of the 1960s—the "swim" and the "jerk." There were a lot of cameras and a bunch of teenagers hanging around a man with very black hair. I do remember Elvis, but didn't think he was very interesting at that time. I was into the Beatles.

What I did learn from this was that culture is very mercurial. We shout and scream about things that affect us in a variety of emotional ways. As teenagers, we are emotional about music and words like "love" and "breakup." Today, as adults, we are emotional about things like "life" and "death."

In 1985 I was booked, along with another futurist, on KOTO

radio to talk about the future. We discussed art and technology, transhumanism and cryonics. Although I was relaxed, the interviewer hadn't read any of my writings, or any other writings about superlongevity. I spent most of the hour interview explaining the very basics. One person who showed up to discuss the content of the program was John Naisbitt. The fact that he is the author of *Megatrends* was rewarding enough.

Years later, I was booked on a national TV program called "Home and Family" hosted by Christina Ferrare. It was live, taped at Universal Studios, and airing direct time out of Manhattan. I was invited on the program to talk about cryonics. No one told me that Christina Ferrare was a born-again Christian, or that another guest on the program, David Carradine, was into reincarnation.

So, I was confronted with the question of what happens to the soul. I wasn't quick enough to reply with "It's on the bottom of my shoe," or any of the other witty parables that I now



If the journalist's credo is to "write tight," than the interviewee's credo should be "speak succinctly."

quickly whip out.

Speaking of souls, about ten years ago some Alcor members did an interview on a TV program called "The Other Side." By the title alone, I suspected that it was not on the up-and-up but the producers were so sweet, so helpful, so enthusiastic, so in agreement that cryonics would not be treated poorly by the host, that I thought that it would be alright. Wrong. Regardless of their impressive social skills toward their guests, they were very, very sneaky and planted a psychic in the audience. Then, to add insult to injury, when the psychic caused a debate and the debate got smart, they cut to commercial break and edited it out of the final show.

When you are new to the media/press interview trail, it's easy to get caught up in being favored rather than presenting a concise and provoking, newsworthy interview. And, it is often set up just to make you feel overly important so they can get you to say something that will give their program or article some spin—whether it is what you wanted to say or not. Sometimes the interviewer will try to provoke you to say something "off-camera" while keeping the camera on. This happened to me some years ago when I did an interview for a European TV program. I spent about two hours being taped, and then when the director had called "Cut," they left the camera rolling. We continued talking "off camera," and they used some of this footage in the program without my authorization.

But this happened with a Canadian magazine as well. I can still remember the journalist leaving our home with her tape recorder in the palm of her hand. She lingered at the door for a while and I remember seeing the bright red light on her recorder. She was still taping us, only it was less formal and she got her juiciest comments then. Now I ask to see the recorder on a table and make sure it is turned off after the formal interview. Sometimes, I even have my own recorder on the table recording them as they record me.

Paranoid? No. Just experienced. You see, it depends on what the medium is, who the producers are, and whether the director or interviewer has read any of your writings.

One of my favorite radio interviews was with a program out of Sydney, Australia. The interviewer set up in a small recording studio at Santa Monica College. The sound in the studio was so pure, so resonant, that I reveled in using my voice like a fine instrument. I loved talking because it literally felt so good. There is nothing like an excellent recording studio to make a person want to express him or herself. The interview was informative, I was told, but I'll never forget the high quality sound system in such an inconspicuous recording studio.

My least favorite was with the Village Voice's *LA Weekly* magazine. The *Weekly* phoned me and said they wanted to do a cover story on my life and work. One of the *Weekly*'s journalists was known for being a Luddite. He didn't like space travel. He didn't like the idea of living longer. He was opposed to superlongevity, cryonics, and transhumanism. To add insult to injury, he was the journalist selected to write the cover story that featured me. Since this minor challenge, I have spoken with friends about their press challenges. Hearing some of their experiences made me feel lucky. At least this journalist critiqued my work ("Primo [Posthuman] 3M+") in a very positive light and said I was an "impressive advertisement for superlongevity." A little positive hyperbole balanced out the factoids.

But what can we do when a journalist takes words out of context, misquotes, and fictionalizes the truth? The answer is not much. Unless it is a hard-nosed and abusive mistruth, all we can do is to move on and trust that people are smart enough to realize what publication is printing the article and the style of the journalist. Herein, the *LA Weekly* is known for being a leftist magazine. It also has carte blanche for hyping a story for dramatic effect. As with most magazines, the burden of proof lies with the interviewee, not the interviewer. Regardless, unless someone really is hurtful, it's not worth the effort of dispute. The best advice I can give in this type of circumstance is to ignore it and just do your work as best you can and always focus on your own integrity. Ultimately, this is what will be remembered and will shine through.

A beneficial and unassuming interview was with Stanford University's Graduate Film Department. Two very bright women, Elizabeth James and Elizabeth Witham, co-produced and directed a short film titled "Precipice." The content focused on a discus-

sion about genetic engineering, bioethics, and the future of the human body. I discussed the theory of agelessness and "Primo Posthuman," and William M. Hurlbut, professor of human biology at Stanford and member of the President's Council on Bioethics talked about why we would not live longer. The format was a point/counterpoint.

Aubrey de Grey was visiting us from Europe and just happened to be in our home when the Stanford filmmakers were in town. He ended up driving with them back to northern California, and on the trip they interviewed him and included him in the film. This was an excellent decision and was the best backup that I could imagine. Aubrey's articulation balanced the interview nicely.

Interviews that pull in just the right producer and director, interviewer, content, and subject are rare. Interviews, such as the Stanford University film project, are rare because they exquisitely take ideas that may be difficult to understand and present them with a sense of ease with just the right touch of information, controversy, and resolve.

If I ever put my finger on what might be a top-notch and meaningful interview, I'm not sure which side of the pen I will be on. But, it really doesn't matter. I find that being interviewed is equally as satisfying as performing the interview. In both cases, you get to meet very interesting people. I bet that Jerry Lemler would enjoy interviewing Charlie Rose, or at least Jay Leno. I'd like to interview Jay Leno, but I'd rather do it during his stand-up routine, where he is at his best.

As far as enthusiasm is concerned, most interviewers are enthusiastic about discussing the future. Germany and Italy have been the most receptive to the idea of superlongevity and changing the human body. BBC, PBS, and TLC documentaries have been the most fun, hands down. To my experience, they do their research, they are on time, and if they move any furniture, they usually put it back. And, in contrast to the past, nine times out of ten the camera crews are excited about the future and a world of possibility, including living longer.

Remember that the journalist doesn't have to agree with you. She doesn't even have to like what you say. But she is a journalist, after all, and she will always have an inquiring mind. And you? Be charming and vital. It's part of the job description.

1

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The Car



by Jessica Sikes

It is hot in Arizona, especially in the summer, and it is very difficult to ride around town in a vehicle that has no air conditioner. The Ford Explorer I was driving, a hand-me-down that had belonged first to my mother, then my brother, then my dad, was creeping up on 197,000 miles, the air conditioner didn't work, and it was time to trade it in. Prior to trading the Explorer, I have never bought a car. Every car I have ever driven has been a hand-me-down, given to me by my parents or my grandparents. Don't get me wrong—I'm certainly not complaining about the vehicles I have had to drive, it's just that at 27 years of age, it was certainly time I "grew up" and got my own car.

"Place of employment?" the man behind the desk asked me, forcing a smile as he sorted through stacks of paperwork.

"Alcor Life Extension Foundation," I replied, steady-ing myself for the next inevitable round of questions, the "What do you do there?" and "Where is that located?" and "I've never heard of that before" comments. I fiddled with the pen in my hand, popping the top on and off.

"Oh!" he exclaimed. "You guys have been in the news a lot lately! Is it true you froze Ted Williams? I think it's so interesting what you do!"

I felt myself become more alert, a smile coming over my face. I was surprised at the turn the tables had taken. Here I was, buying a car, and the finance man was the one suddenly interested in what I did for a living. "Well of course I cannot say whether or not we have Mr. Williams, and yes, our work is very interesting," I told him, somewhat surprised by the numerous questions he then asked about my job and my interest in cryonics. He showed me a picture of his "babies"—his two terriers—and asked me about pet preservation. I explained, as best I could, some of Alcor's procedures, policies, and practices. He appeared genuinely interested, and fortunately I was able to give him a copy of *ALEFI* (*Alcor Life Extension Foundation: An Introduction*)—it was in the car I was trading in.

I left the dealership that evening with a great feeling. Thanks to the alliance I formed with the finance man, he helped me get a lower rate, an extended warranty, and a car I could afford and now enjoy driving. Hopefully I educated him on cryonics, putting aside any misconceptions he may have had, so that he might educate others.

Being a cryonicist means many things. First and foremost, it means being different from most people. Fortunately, through the positive media coverage Alcor has received of late, being different is no longer considered appalling. People are beginning to become more receptive to the idea of cryonics, more willing to listen to the possibility that it just might work, and more accepting of the notion of cryonics as a choice. As cryonicists, it should be our goal to educate others in a positive light while conducting our own business in the best manner possible. I was both amazed and refreshed to find how receptive the man in the finance department at the car dealership was; not only was he willing to learn about cryonics, he was willing to help me get a better deal on my car because I was friendly to him and informative.

The increased media coverage we have had here at Alcor has not been easy to cope with. It has meant rearranging schedules to meet with the media, fielding rude phone calls from angry journalists who did not get their stories, and days of being made to feel as though we were under attack while the media camped outside the facility. Throughout this issue of *Cryonics* magazine, I'm sure you will be reading accounts of the distractions the media caused. More than a time or two I found myself wanting to go outside and then needing to remind myself of the photographers "out there," waiting to snap pictures. We were literally stuck inside the building for days because of the media presence.

Was it worth it? I undoubtedly believe so. To be able to go to a local car dealership and be recognized and *appreciated* as a cryonicist, not shunned, is, in my opinion, a milestone. The courageous people who have made sacrifices throughout the years to get cryonics to the point it is today should be applauded. Stand up and take a bow—you deserve it, and I certainly thank you. So does my car, the aptly named Theodora.

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An Interview with

New Alcor Life Extension Foundation Director

Michael R. Seidl



Cryonics editor Lisa L. Lock met with Michael R. Seidl, new member of the Board of Directors of the Alcor Life Extension Foundation, in late September 2002, just after the annual Board meeting, to discuss Alcor, cryonics, and the future of things in general. The following is an excerpt from their conversation.

Lock: So, tell us a little about your background.

Seidl: I was born in the 1960s and grew up outside of Baltimore. My father was an executive with Black & Decker; he'd started on the shop floor, as a tool and die maker, and worked his way up through the ranks. He always stressed the fact that his was the last generation that was going to be able to get away with that, to become managers and executives without going to college. My mother was a housewife; she stayed home and raised my sister and me and, on the side, indulged her artistic interests. I remember when I was a boy being fascinated by the increasingly sophisticated range of crafts she pursued, from decorating existing things like lamps and bottles, to making her own stained glass, and eventually to throwing her own pots—she stuck with that one and has made some beautiful things. They were both very bullish on education and encouraged me to read widely.

I did normal kid things, I suppose. My parents tried to encourage me to strike a balance, although I liked to spend my time reading and writing. I ran cross country in high school and focused on creative writing. I went off to college—James Madison University—in central Virginia and majored in English, minored in psychology. I thought I'd be a poet or a novelist. When I graduated college I was still clerking in a convenience store; it was nothing like the movie *Clerks*. I found I couldn't sell a story or a poem at any price. So I went back to school, to graduate school in English, figuring at least with that I could get a job teaching. I got an M.A. in English at JMU; then I moved to the

University of Delaware to work on my Ph.D. in 1990. Along the way I taught some classes, worked as a speechwriter for the U of D president, and read a lot of books. Most of the way through the program it became apparent that there weren't a lot of jobs for university English professors and, even if there were, I was no longer sure I wanted to be one. So I moved on to law school—Georgetown Law, in Washington, D.C. I finished the program there in 1996, clerked for two years for a Judge on the United States Court of Appeals for Veterans Claims, then moved back to Delaware, where I've been practicing corporate bankruptcy law ever since.

Lock: How did you get interested in cryonics?

Seidl: The *Readers Digest*. Really. It was the kind of magazine we had in our house when I was growing up. There was an advertisement that appeared in the *Readers Digest*, not once but several times, for one of those *Time-Life*-type books that were popular at the time, with titles like *Mysteries of Science* and *Unbelievable but True*. One of the ads showed a body, maybe several bodies, I don't recall, wrapped in what looked like aluminum foil, with a caption like "Right now, 11 people lie frozen in California, hoping to be awoken one day." I remember thinking something like, "Well, that's interesting but kind of crazy—they're dead, aren't they? Even if we could start them back up again, wouldn't they just die again almost right away?" The idea kind of sat there, in the back of my mind.

I never gave it much critical thought then. Of course, I saw all the popular culture depictions of cryonics or suspended animation—things like the original *Planet of the Apes* film and *2001: A Space Odyssey*, where the astronauts are put into cold sleep. In college I think I even discussed the concept with one of my roommates; I'm not sure how it came up, probably from some

science fiction novel one or the other of us was reading. He told me, in no uncertain terms, that freezing would burst every cell in my body, and if I weren't dead before I was frozen, I'd be plenty too dead to ever thaw out and wake up again after. That made intuitive sense to me and, again, I didn't give it much more thought.

Then a funny thing happened. It sounds almost too incredible to believe, even to me, and it happened to me. I was between my M.A. and Ph.D. programs and, for the first time in years, I was home for the summer, living with the folks again and waiting for the scholarship to the Ph.D. program to kick in for the fall semester. I'd put away some money, so I hadn't taken a summer job—I only had a few weeks between the time I left JMU and the time I was supposed to show up for my first meeting at the University of Delaware to discuss how we'd teach our new students. I didn't have much to do at home—mow the grass and weed the garden, things like that. And I was sick and tired of novels and plays and poems, just sick to death of fiction and literature, which was all I'd read in years, since I got through my core requirements in college. I'd gotten in the mail one of those big book advertisements they used to print—I think they've been relegated to the dustbin of history by Amazon Dot Com—you know, they're the size of newspapers, 18 inches wide and 24 inches long, on cheap newsprint, about 50 pages front and back, filled with tiny boxes with the title and author of each book and a couple sentences on each. Thousands, tens of thousands of books. And I laid on my bed in my bedroom, bored, tired of literature, and I read every single book write-up in that ad. And with a blue pen I marked and then ordered two books that seemed like they would be a good break from the piles of literature and literary theory I'd been reading. The two books were Marvin Minsky's *Society of Mind* and K. Eric Drexler's *Engines of Creation*. By the time they'd come, I was already in Delaware, working on my Ph.D., but it didn't take my whole attention, and I read through both books in pretty short order. They were exactly what I needed to read; imagine the chance of my plucking both together at the same time from that ad, especially given my background. From Minsky I got the indisputably compelling argument that mind—consciousness—is an assembly of smaller constituent parts—it's all just neurons working together. From Drexler I got a similarly compelling argument that the time was coming when science would be able to manipulate matter on the cellular level and smaller, be able to repair the body and eliminate sickness and disease, be able to repair even the damage of freezing. Together the combination was unbeatable.

Lock: So, you signed up right away? [laughs]

Seidl: You know perfectly well that's not the case. [Ed.'s note: Michael and Lisa met in 1990 at the University of Delaware and married in 1998]. I didn't as yet have any sense that there were active, approachable cryonics organizations out there doing the work, and I certainly didn't think it was affordable. I just filed the information away in my head, thinking "one day when I have

the means, this is something I want to pursue, because it sounds like it ought to work."

Within a few years after that, though, I had access to the World Wide Web, and cryonics had stayed in the back of my mind. I found both Alcor and Cryonics Institute online, perhaps some other groups too, requested their information, and eventually signed up with Alcor.

Lock: Why did you select Alcor?

Seidl: That was a difficult choice. I certainly didn't see anything wrong with the other institutions. I was strongly influenced by the presence of Drs. Drexler and Minsky on the Alcor scientific advisory board. As I said, they were the source of my initial serious interest, and their affiliation was significant. Alcor seemed to be pressing a more medical model of the process too, which I found encouraging.

Lock: Was cost an issue?

Seidl: Sure. Isn't it always? People say it's affordable with insurance and, of course, it is, generally speaking. However, between, oh say \$400 in dues and \$600 in a whole life policy for a younger person, annually, that's a hefty price for someone without a lot of disposable income in his or her budget. I was living lean in school. Could I have carved out that much money from an already tight budget? Maybe. Once I had a little bit of disposable income, cryonics was one of the first things on my list for the use of that disposable income. I think the cost-benefit analysis weighs in favor of suspension, assuming you've got financial flexibility to make that analysis.

Lock: How did you get more involved with Alcor?

Seidl: Well, we'd been members for a while when we made plans to attend the 3rd Alcor Conference in Asilomar, California. You had been corresponding with Fred and Linda Chamberlain about helping out with *Cryonics* magazine. The Chamberlains were very gracious to us at the conference—walked us around and introduced us to people. We met Jerry and Paula Lemler there too, who were new to Alcor. Soon thereafter you took over as editor of *Cryonics* and became a Board advisor. Fred and Linda started calling or e-mailing me periodically with legal issues, and I was glad to help out. Eventually, I was asked to join the Board's advisors in my own right. I was pretty active as an advisor—lawyers have opinions on almost everything, and verbal lawyers like me actually have opinions on literally everything. This year the Board asked me to join as a Director, and I accepted. Here I am.

Lock: Do you have any goals for Alcor, as a Director?

Seidl: Goals?! [laughs] I wouldn't be that presumptuous. I'm consistently impressed by the foresight of Fred and Linda Cham-

berlain in starting Alcor, by the foresight of the people who work there, and by the foresight of its other Directors. These are people who've taken a radical idea and, sometimes on a shoestring, made it a reality for more than 30 years. My first goal is to not break any of the fabulous things they've accomplished—as we say, “First, do no harm.”

After that? I know I'm probably the youngest Director. I'd like to absorb some of the experience of our other Directors and other people in the community, to synthesize that from my perspective, and to move ahead into the tomorrow of Alcor. I've got a lot to learn from the people who've made this happen. As for me personally, I'd like to see Alcor grow just enough to start profiting from some economies of scale, to be doing 40 or 50 suspensions a year and maintaining a full-time surgical/suspension team, buying LN2 in large bulk, maybe flying suspension teams around on its own jet and maintaining a full-time political action committee to lobby for us.

Lock: How do we get there?

Seidl: More of the same. We've got a great model—a medical model based upon the best suspension with the least additional damage possible, moving toward true suspended animation. We've got a fabulous new PR department putting a polished spin on the things that are great about Alcor. We've got wonderful officers and staff who make the whole thing work, talented Directors who give generously of their time, members willing to take on local responsibility, and more. We're going to keep growing, by increments at least, more quickly maybe.

Lock: Anything else?

Seidl: An operations endowment. We've done great with the Patient Care Trust, segregating money for maintenance and recovery. We've got a new push under way soliciting contributions and support for various projects. But I'd like to see us think about operations on a long-term scale. Basically, Alcor's day-to-day operations are funded by annual dues, cash inflow from the operations portion of the funding from newly suspended members, and contributions. I'd like to see us build an endowment to help fund operations; I think there's an untapped source out there, people who may not want to give to buy a piece of equipment per se, but who would contribute on the condition that the money would be locked away in an endowment where we'd use just a portion of the interest to fund operational needs. I see Alcor becoming like other large nonprofits—museums and such—that have a large endowment that gives them fiscal stability even as contributions and other income waxes and wanes.

Lock: What do you think you bring to the Board?

Seidl: Paranoia. Not in the psychologically disturbed sense, just a careful lawyer's “what if” that wants to think about all the permutations. Actually, the Board is great at that even without

me. I guess I've also got a lawyer's sense of when to fight and when to settle, and the negotiating skills that go with that. That is, not paranoia that hunkers down in fear but paranoia that thinks about all the possibilities and carefully selects when to go on the offensive and when to go on the defensive. I've got an opinion about everything, and I always want to have all my facts put together before I offer it—that's another lawyer thing. And I'm in this for the long haul.

Lock: What do you think, is cryonics going to work?

Seidl: Just lob that up there for me. You know what I think about this. It's really a poor way to ask the question, and we hear it all the time—“will cryonics work?” or the contrary “cryonics will never work,” blah blah blah. It's really two questions: (1) does cryonics work? and (2) will we be revived? As Dr. Drexler exclaimed at the 3rd Alcor Conference, cryonics does work—it freezes people. We're getting better and better at freezing people; we don't even want to call it freezing anymore, we want to call it vitrification because the cellular preservation is so good. So, yes, cryonics works—we can achieve cellular stasis. Will we be revived? I don't know. It seems to me that, if I'm suspended under good conditions (or even not-so-good conditions), as I understand the science from my English literature and lawyer enthusiastic layman's perspective, there's a pretty good chance of my being able to be restored. Will I be suspended under such conditions?—I've got no way to know. Will something else intervene after I'm frozen and prevent my recovery, giant asteroids or nuclear war or global Luddite theocracy—I've got no way to know. Will “it” work? Under the right conditions, and barring accidents preventing my suspension and/or the slow progress of science, I think so. Or I wouldn't be signed up, would I?

Lock: What are you getting at with your column in *Cryonics*?

Seidl: You mean you don't know either? [laughs] “First Thoughts on Last Matters”—it's just an effort to make some first cuts, new cuts, at ultimate cryonics (last) issues. One of the difficulties with a cryonics magazine is that the range is a little limited; I mean, once you've made the case for cryonics—which I think is a pretty simple case—it's all a matter of rehashing what we all know, reporting on what's happened lately, or speculating on the future. I'm trying, with the column, to take novel approaches to issues we've all been over and over again.

Lock: So what do you think the goal of *Cryonics* magazine should be.

Seidl: That's a difficult question. I think we're at a transitional phase in the history of Alcor. Well, every moment is transitional, isn't it—but this is a resonantly transitional moment. We're moving increasingly into the public eye. *Cryonics* still needs to satisfy the requirements of a small-organization newsletter; it needs to tell members what's going on at Alcor on an institu-

tional level (new suspensions [when public], new practices, new hires, etc.). It also needs to increasingly provide general interest material—that is, material of interest to a variety of people in the field, cryonicists, transhumanists, venturists, extropians, etc. That’s a difficult balance to strike, and it’s complicated by the fact that we’re a small community with few writers we can draw on. We all owe a huge debt to a handful of people who keep writing—thinking about these issues out loud—on demand. It would be fabulous if we could consolidate all the related publications into a single one. Right now it sometimes seems like we’re grappling for material—there’s a lot of overlap, and we have talented people giving a couple pages here and a couple more there. Of course, no one wants to give up their own editorial control and continuity of publication, so that’s unlikely to happen. We need to just continue being all things to all people until the community grows large enough that that becomes as easy as it should be.

Lock: Why aren’t more people signed up to be cryosuspended, do you think?

Seidl: At least three reasons, I believe.

(1) Ignorance—they haven’t heard about it or have heard about it without getting enough information to make a rational analysis; we can remedy this with more and better PR.

(2) Fear—people aren’t willing to confront the possibility of their own deaths and/or aren’t willing to confront the possibility of never seeing loved ones again. By this I mean that, when someone we love dies, one of the ways we deal with that wound, that wound that never heals, is with the hope—even if abstract or unarticulated, although in many cases it’s very clear and articulated—that we’ll see that person again in an afterlife. Anyone who’s lost any loved one has a disincentive to choose cryonics, even if he or she can confront the prospect of his or her own death, because, on some level, it requires saying “if this works, it radically decreases even whatever minimal chance there is that I will ever see x again; I might never die, and I know I’m never seeing x again in this world.” That’s an incredibly painful realization. I’m not sure there’s any good way to remedy this. We can rationally get people to confront the imminence and consequences of their own death—life insurances sales agents accomplish that all the time—but to get them to accept that absolute loss? I don’t know. There’s a line in *King Lear* where Lear, grieving over the loss of his daughter, expresses how he’ll never see her again, and he says “never never never never never.” Five times—a whole line of verse. It hurts Lear to say that five times; it hurts the audience to hear it dragged out five times. Cryonics asks you to repeat that never again forever. It hurts.

And (3) existing belief systems may contradict cryonics. That is, people may have learned about it, they may have confronted their own fear of death and be willing to face the trauma of “never,” but they may still be stuck in a divergent world view. They may say, well, we shouldn’t meddle with nature or we’re given one life, what would I do with another or it would be tak-

ing more than my share or it would interfere with my karmic rebirth or what about heaven or whatever. Belief systems are hard to change, and I’m not even sure it’s appropriate to try. It’s patriarchal, parental, to say my belief system is correct and you should change yours to fit mine because it’s for your own good, because (in the case of cryonics) you’ll get to live forever, maybe. I’m American, both by birth and by continued choice; I believe we ought to let grown, mentally competent people make their own choices, that just as we don’t force them to have transfusions or accept other medical procedures if they don’t wish we ought not to force them to accept cryonics, or to try to talk them out of the beliefs they have that prevent their accepting cryonics. Cryonics adds real poignancy to the right to die argument—if, as cryonicists, we support the right to die as an exercise of individual free will, I think we also have to accept the right to practice a belief system that will as surely lead to death. I don’t like it—I’d love to be able to stand up and say “but it’s so obvious that this is a great idea, please come and get suspended” and have everyone do it—but there’s no alternative I’m comfortable with.

Lock: So how do you feel about Alcor’s increased role in the public eye, the active role it’s taking in PR.

Seidl: Well, PR really has two roles, doesn’t it? On the one hand, you want to do damage control and institutional promotion to maintain what you’ve got; you want to be sure that you present yourself in such a way that you’re allowed to keep on doing what you’re doing with as many people as express an interest, that you’re not subjected to onerous oversight or regulation or outright banning. That’s an important and necessary role. The other role is to market cryonics to new members. I didn’t mean by my foregoing comments that we ought not to be trying to sell cryonics; by all means, we should sell all we can—we’ll all benefit from economies of scale and the increasing normalization of the field—make it everyday, normal, pedestrian.

Lock: Thanks for your answers. I’d like to close this interview with a permutation on the *Inside the Actors Studio* questionnaire...

Seidl: I’m not going to tell you my favorite curse word; I don’t think you can print that.

Lock: No, no. Just this, if cryonics works . . . I should say, given your comments, if you’re successfully suspended and revived, what do you hope to hear the doctor who awakens you say?

Seidl: “Welcome back; there are a lot of people here who are anxious to see you again.”

Some Secrets the Insurance Companies Don't Want You to Know

by Rudi Hoffman, CFP



Why do you think most people have about the same level of enthusiasm about dealing with life insurance people that they have about going to the dentist for a root canal? Many folks would just as soon visit their doctor, or even, ych, a lawyer, as talk with the “insurance man.”

Gimme That Remote

“Life insurance is boring, confusing, complicated, and not as much fun as watching reruns of sitcoms,” might be asserted by someone not as astute as you, dear reader. Not surprisingly, this article is going to explode this myth. You may be assured that you will be a more knowledgeable and educated individual about life insurance in a very short time.

Life insurance is fairly straightforward in concept. The insurance company is taking a bet that you are not going to die. Actually, they are fairly certain you **are** going to die (cryonics issues aside), but they are just assuming you are not going to die right away. You pay a relatively small amount of money to the insurance company, called a *premium*, and if you “die” they pay a relatively **large** amount of money to the people you specified to get the money, called the *beneficiaries*. The amount paid is called the *proceeds* or *face amount* of the policy.

Yawn...pretty basic stuff, and you knew all this already, right? OK, let's take it to the next level.

Hang On...We're Moving Faster Now

The simplest form of life insurance is called *term* insurance. This is insurance for a “term,” or period of time. Ten-, twenty-, and thirty-year term policies keep both the premium and the face amount level for these stated periods. At the end of the period, the policy can be **renewed** if the policy has a feature called *guaranteed renewability*, with **no** evidence of insurability to be provided to the company. **But...** the premium will take such a large increase that many people drop their term coverage because they cannot afford it in their later years.

Not surprisingly, the insurance companies have figured this out, and they generate huge profits on the term policies that do not renew. If you pay your premium for 17 years, for instance, and discontinue your policy upon renewal when the rates go up, the company is “off the hook” altogether in the later years when you are much more likely to die.

This is one of the reasons why the LIMRA (Life Insurance Marketing Research Association) has found that only about 3 percent of term policies ever really result in an actual claim. It is not that the insurance company lies about paying the face amount of the policy during the period of coverage. Instead, there is a mathematical fact that people die in the **later** years, not in the earlier years. And the statistical science of pricing insurance policies, called *actuarial science*, is structured to make sure that term policies price themselves very high in the later years when the mortality tables say you are likely to die.

Whole Life or Low Life?

The next major category of life insurance is called *whole life* insurance. This is an insurance policy that is designed to last your “whole life.” What the insurance companies do is charge you much more in the earlier years, with the extra amount going into a fund called the *cash value* of the policy.

Now, old fashioned whole life policies accumulated these “cash values” at very low rates of return, making them very bad deals from an investment standpoint.

The Federal Trade Commission came out with a very controversial report in 1979 indicating that the average rate of return credited to the consumer on a traditional “cash value” whole life policy was only 1.3 percent!

“Rip-off!” “Terrible Investment!” shouted the consumers. And they were right. Especially during the 1980s, when even guaranteed CD interest was as high as 12 percent, the low yield on the cash value of traditional policies made them subject to replacement according to the concept “Buy Term and Invest the Difference.”

I personally was recruited into the insurance industry in 1978 as part of a crusade against the so-called evils of traditional whole life insurance policies. "Those traditional whole life policies are a 'screw job' against the consumers," my boss would rant. "They are an expensive form of insurance and a terrible investment. If a man sells whole life, he is a low life!"

And my boss was right. In a mathematically demonstrable way, the traditional, older whole life policies were costing the consumer much more than the newer and more cleverly designed insurance and investment products.

So, the 1980s and 1990s saw the so-called insurance wars, in which brother was turned against brother. If your brother sold you a whole life policy with Prudential, it was my job to show you a computer spreadsheet that revealed just how badly Prudential and your own brother had ripped you off. Not surprising, this created a huge amount of controversy, which I was privileged to participate in.

During these decades it was my pleasure, my joy, and my job to replace "deadwood policies." The highly profitable older policies with their big fat juicy cash value languishing away at the paltry returns of 1 or 2 percent per year, and the insurance costs based on the old mortality tables, sold by traditional companies such as Metropolitan and Prudential, would be switched to modern and more consumer-oriented programs.

The Times, They Are A-Changin'

But the industry changed! Even traditional companies came out with policies that accumulated cash value at much **better** rates of return. The cash values inside modern permanent policies grow at interest rates that are in most cases **higher** than those available on guaranteed savings accounts. And the cash values also grow free from the shrinkage of taxation and the predations of creditors.

Current whole life policies also have lower internal mortality and expense costs, meaning there is more money available to grow in the cash value, which is the cash accumulation part of the policy. And these policies, called *interest sensitive whole life* policies, credit returns from 2 to 4 percent higher than current Certificate of Deposit interest rates!

Universal Life

Universal life is a flexible policy designed to reap the benefits of the "Buy Term and Invest the Difference" idea with the permanence, tax benefits, and long-term solidity of whole life insurance.

We can think of premiums invested in universal life as payments into a savings account, growing tax deferred at 5 or 6 percent interest. Out of this "bucket of money" comes the annual renewable term cost of life insurance. This "in-

ternal cost" of term will be coming from the growing cash value, but if the payments **in** to the bucket, and the interest **growing** on these payments, is sufficient, then the policy will remain in force.

If the cash value in the bucket gets low, you might have to put more money in. But, universal life gives us the flexibility to increase, decrease, or vary the contributions into this savings account. One can see computer projections that demonstrate how the policy will perform at different interest rate assumptions.

Look Ma, No Premiums!

You can even put enough money into the policy so that the cash value will pay the policy by itself. Your premiums will vanish; no further premiums are required; and your policy will remain in force past age 100! No other form of insurance provides this degree of flexibility.

The latest wrinkle is universal life policies that provide the same **guarantees** as whole life policies, with premium investments that are about half the cost of even modern interest-sensitive whole life policies.

1

For Further Research

You can get more information, and an individualized quote or comparison, by visiting rudihoffman.com. Multiple resources for information and comparison will be made available to you at no cost.

Web site: rudihoffman.com

Member Alcor Life Extension Foundation
(www.alcor.org)

Member Financial Planning Association,
Certified Planner (www.fpafla.org)



Leonard N. Zubkoff

December 19, 1957 – August 29, 2002

Leonard Nathan Zubkoff of Crystal Bay, Nevada, world-renowned for his expertise in computer architecture and operating systems, died on August 29, 2002, in a helicopter crash in Misty Fjords National Monument Wilderness near Ketchikan, Alaska.

Leonard was a software developer and entrepreneur with a talent for understanding how to get the most from computer hardware. Leonard's interest was in improving computer usability, especially responsiveness, and his expertise was in the software closest to the machine's hardware.

Leonard started his career in 1975 when he entered the University of Rochester. He double-majored in mathematics and physics and graduated summa cum laude in only three years. He continued graduate study in computer science at Carnegie-Mellon University and earned a Master of Science degree in computer science. At CMU he developed algorithms and protocols for high-speed communications between time-shared computers and remote terminals over phone lines. His programs were used in computer centers at Carnegie-Mellon, the Massachusetts Institute of Technology, and Stanford University.

In 1985, Leonard was recruited by Lucid, Inc., of Menlo Park, California. He served as Principal Scientist, specializing in porting technology, performance, and machine and operating-system level architectures. Leonard developed runtime memory managers, debugging software, windowing systems, process threading models, compiler enhancements, and software porting technology. His expertise and advice informed company strategy, and he was one of a handful of technology leaders at the company.

In 1994, he joined Oracle Corporation in Redwood Shores, California. While there his interests shifted to open-source software and operating systems. During his career, Leonard noticed that software developed at companies tended to be written under strict pressure to meet schedules, forcing software developers to make technical compromises. Leonard valued doing things the right way—he was a craftsman when

it came to low-level software code, and he found that doing things beautifully usually resulted in the best software performance. Open-source software is typically not written to any fixed schedule, and doing things properly is highly valued. In Linux, Leonard found an operating-system project where he could apply his passions for excellent craftsmanship and quick response.

In 1998, Leonard joined VA Linux (now VA Software) of Fremont, California, as Chief Technical Officer. At VA, he improved Linux stability and performance on multiprocessor systems and on systems with large disk arrays. He worked with chipset and motherboard vendors to improve their designs for the Linux market.

Leonard had a keen interest in future technologies and joined the Foresight Institute (“Preparing for Nanotechnology”) in 1989. He was taken with the idea that molecular machines could someday repair cellular and even molecular damage.

He had joined Alcor Life Extension Foundation in 1988. Leonard was an active member of Alcor's suspension team for many years and also provided advice and assistance with Alcor's computer systems. He became an Alcor Advisor to the Board of Directors in June of 2002.

Leonard was prominent in the world of science fiction fandom and filk (musical parodies on contemporary issues). He founded Dandelion Digital to provide state-of-the-art digital recordings of filk music. Dandelion Digital released seven albums.

Leonard is survived by his former wives, Jan (Stover) Jewell of San Jose, California, and Jaylene Lewis of Berkeley, California; his brother, David J. Zubkoff; and his uncles, Maurice J. Zubkoff of Chevy Chase, Maryland, and Paul L. Zubkoff of Williamsburg, Virginia. He was preceded in death by his parents, Bernard S. and Renee I. (Seaman) Zubkoff.

Leonard was a benefactor, a mentor, and a friend. His contributions and expertise will be missed here at Alcor. Most of all, we will miss his smiles. 1

Tributes to Leonard...

This man was a “nudge” in every sense of the term. Whenever he argued a point or suggested a proposal, he wouldn’t let you out of his sight until you (at minimum) acknowledged his position as having relevance and therefore worthy of further contemplation, if not full and complete agreement. Leonard would not infrequently plop himself down in my office, unannounced and uninvited, and no matter how diligently I attempted to (meaninglessly) shuffle papers on my desk (feigning preoccupation), he would “wait me out,” never budging from his chair. The man was relentless.

Pilots are well known for swapping flying tales, and, yes, embellishing them a smidgen or two. As a private aviator (inactive) myself, Leonard and I engaged in many such repartees to the unbridled delight of us both. This bond of camaraderie between us continued to the very end. Certainly, I harbored trepidations of what might befall my friend as he took to the sky, and I never shared with him my own “near miss” experience, while flying one otherwise glorious Autumn afternoon on partial panel.

Oh, how I wish in my lifetime I could meet more nudges like Leonard Zubkoff. And my personal message to him would be: “Come into my office and sit down any time you desire, my good friend. I will never have enough papers to shuffle.”

—Jerry Lemler

Like others here at Alcor Central, I was shocked and saddened to hear of the tragic events of August 29, in which Leonard lost his life in a helicopter accident. I remember him as a friendly, outgoing sort who could be depended on for advice and troubleshooting in his work as our network facilitator. (Yes, this is an informal title, but that’s what he did—volunteer work—that’s the kind of generous person he was, and he was good at what he did.) Since his accident I’ve learned more about him, in particular, that he loved the rugged outdoors, something that strikes a responsive chord. And, of course, he was a cryonicist, and one of our own, whom we intend to restore someday, if it proves possible. We’ll certainly try our best.

—Mike Perry

In what were to be Leonard’s last months of his first life cycle, he began to enjoy being out-of-doors close to the home he loved in Crystal Bay as well as taking a new interest in keeping his body healthy and in shape. Leonard began taking nearly daily hikes into the Sierra Nevada peaks surrounding his home. He went so far as to buy a GPS and record each and every hike he took. Leonard always knew exactly where he was and where he had been. It was the future he looked forward to. He talked about hiking the entire rim trail in the Crystal Bay area.

Leonard was also looking forward to flying his helicopter to the vicinity of the highest point in each of the 50 United States, and then walking, hiking, or climbing to the top of each one. He was to participate in this project with Kat Cotter and me. These hikes and climbs were the subjects of many conversations and contemplations in Leonard’s last days of this life cycle.

Every day he was home Leonard spent time looking out the windows of his home toward Lake Tahoe along the shoreline of Crystal Bay. There, he was able to see the beautiful snow-topped peaks reflected in the water. He often commented on how the lake never looked the same and how the unique and gorgeous storm clouds gathered above it. I believe he spent many hours contemplating the lake and the clouds. He drank his special morning coffee each day he was home while watching the lake change colors either from his deck or out the kitchen windows.

Leonard loved going to the shores of Lake Tahoe and beyond in a kayak (which he had tried for the first time earlier this summer). Leonard had not yet purchased a kayak, but he was looking forward to doing this in the late part of the summer. He thought kayaking was incredible, even though he did not spot any fish in the lake! Leonard was planning to rent a mountain bike and ride the entire fitness trail surrounding Lake Tahoe.

Going to the natural hot springs outside of Truckee, California, was also a great joy to Leonard. The last time he was there the moon was full. It was like an incredible spotlight shining through the trees—the whole forest was in full color under this moon along the trail from the baths. Leonard meditated at the springs while overlooking a moon-swept field in the midst of old growth pine.

Leonard was a tremendous and beautiful being. He had a brilliant mind, and he was more creative than he gave himself credit for. Prior to his untimely and tragic helicopter crash, Leonard requested of his friends that they not mourn his death if he died in a helicopter accident. So far, none of us have been able to honor this request. There is nothing but deep sadness, sorrow, and despair in letting Leonard go, even though he was doing something he loved.

I will miss meditating with Leonard, and I will miss eating cherries with Leonard, but most of all I will miss just being with him in those quiet, peaceful moments we were able to share.

—Karla Steen

October 10, 2002

Alcor Life Extension Foundation
7895 E. Acoma Drive, Suite 110
Scottsdale AZ 85260



From: Michael Riskin, PhD, CPA
Vice President of Alcor
Chairman of Alcor Board of Directors

Dear Alcor Members:

I wish to publicly thank the Alcor members listed below who made a directed contribution to the State Of The Art fund (SOTA) this year. As you may recall, SOTA donations are specifically meant for investment into member service improvements. These improvements include upgrades in emergency standby procedures, operating room suspension technology, and long-term patient care storage methods.

As this note is being written, the Alcor standby team is deployed simultaneously in Houston, Texas, and Scottsdale, Arizona, on behalf of two members. Recently acquired technology, equipment, and personnel upgrades (thanks to the SOTA fund) are being successfully employed in both cases.

Your financial support, as always, at any level, will be greatly appreciated. It is never too late to help Alcor help you. And as a reminder, SOTA charitable donations may be made by check or credit card, via telephone or by mail.

In addition to those contributing SOTA members who specifically requested anonymity, a special Alcor *Thank You* goes to:

DOUGLAS ARNOULT	JERRY AND PAULA LEMLER
MUSIC CHAPMAN	JULIO MARGALLI
ANTHONY CSOKA	CAROL AND RALPH MERKLE
BRADLEY DUDA	MARTY NEMKO
HERMAN EARL	ROBERT NEWPORT
JEFFREY ERDEL	ANITA AND MICHAEL RISKIN
BOBBY FORD	THOMAS SHAPARD
RUPERT HAZLE	JORDAN SPARKS
ERIC GEISLINGER	ALVIN STEINBERG
RICHARD GILMAN	AUSTIN AND RUTH TUPLER
STEPHEN GRANDE	LEE TURNER
DAN JOHNSON	BRIAN WOWK
TERRY KATZ	ARTHUR VILENIUS
BENFORD LARSON	DAVID WARD
MICHAEL LA TORRA	JOSEPH ZARKA
JM LAZARUS	

And to everyone. . . have a truly great day!

Michael Riskin

A

Update

L

President's Report

by Jerry B. Lemler, M.D.

C

The Alcor Life Extension Foundation conducted the annual meeting of its Board of Directors on Sunday, September 8, 2002, at our Scottsdale headquarters. Seven of the eight Directors were in attendance, some traveling to Arizona from as far away as Wilmington, Delaware; and Milwaukee, Wisconsin; and Portland, Oregon. The entire Board contingent (Dr. Kat Cotter, Hugh Hixon, Saul Kent, Dr. Ralph Merkle, Carlos Mondragon, Dr. Michael Riskin, Dr. Michael Seidl, and Stephen Van Sickle) was re-elected by acclamation for the coming year, while Dr. Michael Riskin was re-elected as Chairman of the Board in like fashion. Additionally, the four corporate officers (Dr. Jerry B. Lemler, President/CEO; Dr. Michael Riskin, Vice President; Joe Hovey, Treasurer; Jessica Sikes, Secretary) were re-elected to another term.

O

I'm already busy preparing my various presentations for our 5th Extreme Life Extension Conference in Newport Beach, California, on November 14–17. You may have noted all our announcements and brochures list the conference dates as November 15–17, but we decided to offer an additional free-of-charge, open-to-the-public, Thursday evening (November 14) "Introduction to Cryonics and Alcor" symposium. I will be joined by Conference Chair Dr. Ralph Merkle and Conference Co-Chair Dr. Kat Cotter for this exciting event. On Friday, November 15, I will participate in the last (of four) tutorial sessions. This 90-minute presentation, led by Director of Suspension Services Charles Platt accompanied by members of our technical staff, will focus on Alcor's state-of-the-art cryosuspension procedures. Then, on Saturday morning, November 16, I am scheduled to deliver a 30-minute address entitled "Alcor at 30: Where Do We Go from Here?" I do hope you will make plans to join us in Newport Beach for this special gathering.

R

I am delighted to report to you that the Board approved my recommendation to retain the superb services of veteran cryonicist Charles Platt as our Director of Suspension Services. For those (few, I would guess) who are not familiar with this prominent life extension activist, please allow me to relate the following. Charles Platt was born in England and sold his first science fiction novel while he was still at college. He edited the British magazine *New Worlds* until 1970, when he moved to the United States. He continued to write science fiction and also worked as an editor at three New York publishing houses. In 1979, he acquired an early personal computer and started a small business marketing his own software. Although the business was successful, he saw that software was to become a relatively dull corporate product, and he resumed writing as his primary occupation, ultimately publishing more than 300 articles and 42 fiction and nonfiction books, including *The Silicon Man*, a novel that has an immortalist theme. He taught software design, computer graphics, creative writing, and other courses for the New School for Social Research and also taught at UCLA Extension while he lived for nine months in Los Angeles. When *Wired* magazine was launched in 1993, he was one of its earliest contributors. Ultimately he left book publishing, chose technical journalism as his primary occupation, and was one of the

three senior writers at *Wired* until his departure from the magazine in 2001. He has written about technology for publications including *Discover*, *The Los Angeles Times*, *Yahoo Internet Life*, *The Washington Post*, *Shift*, *Omni*, and many others.

Platt heard about cryonics while he was still living in England but assumed it was a luxury only rich Americans could afford. This misconception lasted until 1988, when he visited the Alcor Foundation at its Riverside, California, location. He became convinced of the potential technical feasibility of cryonics within three hours but remained skeptical about its application in the real world. Ultimately he signed up with Alcor in 1992. He wrote new literature for the organization and did some of its first PR, including the “Omni Immortality Contest,” which appeared in *Omni* magazine in January 1993. The contest generated a huge amount of publicity and probably encouraged between 40 and 60 people to sign up with Alcor, according to the Membership Administrator at that time.

Platt left Alcor in mid-1993, largely because of concerns about management and vulnerability of patient funds (these con-

cerns have long since been resolved, since the creation of an independent trust to manage the patient money). He co-founded CryoCare Foundation, served as its vice president, and ultimately became its president, until CryoCare lost its service provider. Platt rejoined Alcor in 2002.

Platt has written frequently for *Cryonics* magazine, has considered himself a cryonics activist for ten years, and has participated in eight cryopreservation cases. In one last minute case, he did all the fieldwork unaided. In 2002, he was the principal writer of a 40,000-word report that compiled recommendations from a committee of scientists and technical experts who had evaluated all phases of Alcor’s procedures. In his new role with Alcor, Platt’s primary objective will be to implement as many of these recommendations as time, money, and personnel permit.

Are we where we want to be? Certainly not. Are the pieces of the puzzle falling into place? Decidedly so!

I hope you have a safe journey to Newport Beach. I look forward to seeing many of you at the conference. I

Report from the Director of Suspension Services

by Charles Platt

The First Two Weeks

On September 8, 2002, the Alcor Board voted to approve my new status as Director of Suspension Services. This report is being written primarily on September 22, after my first two weeks of service for Alcor.

Originally I joined Alcor about ten years ago and had some success handling public relations. In 1993 I co-founded CryoCare Foundation and eventually became its president, bearing the ultimate responsibility for treatment of our members. I participated in two standbys and handled the initial phase of another case entirely on my own. I also took an active role in CryoCare’s financial situation, and moved it from a net deficit to a net surplus.

This year I was the principal writer of a report that gathered recommendations regarding Alcor procedures from a committee of scientists and researchers. Also I participated in three cryopreservation cases at the Alcor facility. I felt very encouraged by the new “inclusionary” policy that had been established at Alcor and by the organization’s sincere interest in upgrading aspects of its service. I wanted to become more involved and suggested to Dr. Jerry Lemler various roles in which I might be useful. I was surprised and flattered when he suggested I could serve full-time as Alcor’s Director of Suspension Services.

This task embraces the entire sequence of patient care, beginning with premortem standby and continuing through blood

washout, transport, cryoprotective perfusion, and cooldown to storage temperature. Ideally, the Director of Suspension Services makes sure that personnel are fully prepared, all equipment is properly maintained, the medications are stocked, the standby kits are ready to go, the team members are available, and no one makes any avoidable mistakes. I say “ideally” because in the real world, this is a hugely ambitious task for an organization that is primarily supported by a membership base of only about 600 people. Our highly sophisticated procedures often require volunteers to work beside qualified medical professionals because we always have insufficient personnel. Also, just to complicate the situation, the Director of Suspension Services must interact compassionately and sensitively with people who are struggling to survive medical crises—yet must ensure that proper funding is in place.

Still, I accepted the challenge without hesitation because I feel that it’s a very necessary job, and I believe my ten years of experience in cryonics should help me to tackle it with a reasonable chance of success. I have become familiar with every aspect of cryonics, from the fundamental principles of cryobiology to the legalities of sign-up paperwork. I am also very familiar with all the personnel involved and the ways in which each person can help during a standby.

Two days after the Alcor Board approved my new role, I drove to California to participate in a conference on technical issues. The meeting included Dr. Jerry Lemler, Michael Riskin,

representatives from two California laboratories, plus the principals of Suspended Animation, Inc., which has been set up as an independent cryonics service provider. We negotiated tentative agreements that will guarantee Alcor's source of vitrification solution, will allow our personnel to practice surgery in a well-equipped laboratory, and may enable Alcor to design and sponsor experiments to verify some aspects of our procedures. The meeting was cordial and extremely productive—a combination that is rare in the contentious world of cryonics.

While I was in California I visited and conferred with Saul Kent, a cryonics pioneer whose partnership with Bill Faloon has underwritten all the major research into organ cryopreservation during the past decade. I talked to scientists who have been quietly associated with cryonics for many years, and I asked their advice. Unanimously, they recommended that I should concentrate primarily on reducing the time between legal death and the arrival of the cryopatient in the operating room. This confirmed a conclusion that I had reached previously. Although Alcor's operating room has some deficiencies, the most recent cases have received good treatment. Cellular damage is a much bigger danger before the patient reaches the operating room, and currently we are not so well equipped to attack this problem, partly because we constantly lack sufficient personnel.

I arranged to meet some members of the California standby team: Bobby June, Keith Dugue, Peter Voss, and Louise Gold. I asked them to tell me what they needed most, and I was impressed by their dedication, generosity of spirit, and realistic assessment of their problems. Most of all I was impressed by Russell Cheney, the team leader, who has devoted himself full-time to cryonics and has allowed his house and garage to be taken over by transport equipment. Russell is absolutely committed to maintaining high standards in cryonics.

Alas, enthusiasm only takes us so far. Other cryonicists in California don't always have time to attend regular training sessions or standbys—in fact, at this time the number of actively available team members in California is minimal, and in some other areas of the country the capabilities have never been tested. One of my highest priorities is to revitalize the network of Alcor Cryotransport Technicians established by Fred and Linda Chamberlain. As an initial step, Alcor has granted my request to certify and pay team members in southern California when they complete training courses to operate specific equipment. Also I have created a formal payment schedule for those who work shifts during standbys.

In the future, I want to run an ambitious training (or retraining) course featuring several instructors, including a qualified paramedic, a mortician who was formerly a perfusionist, and an experienced practitioner of cryonics procedures. We simply have to enhance our standby capabilities, and everything ultimately rests on the knowledge and abilities of people who implement the procedures. We are planning to augment regional transport technicians with a core group from Alcor who can fly out for any case requiring a remote standby.

Before I returned from California to Arizona, I enjoyed two

unusual privileges. First I participated in some surgery in a laboratory that is pursuing resuscitation research. I practiced blunt dissection and cannulation of a femoral vein. While I would never attempt this delicate work on a human patient, I valued the intimate knowledge that hands-on experience can provide.

Also, I spent a couple of hours talking with a cryobiologist who has done more than anyone else in the world to advance the techniques of organ cryopreservation. I'm excited by the current status of this research and look forward to our application of the results to human patients.

I believe that anyone who accepts a new responsibility should go out into the field to learn the harsh realities, and in this respect my visit to California was extremely instructive. I concluded that the single most useful innovation to reduce transport time would be a vehicle like an ambulance but large enough to enable femoral cutdown and blood washout with organ preservation solution. Such a vehicle would eliminate the detour that patients have been making to local mortuaries for the past 15 years, ever since Mike Darwin and Jerry Leaf first defined the fundamentals of cryotransport.

I have written and submitted an initial proposal for the acquisition of a cryonics vehicle to the Alcor Board. At this stage the proposal is vague because we have several competing suggestions for treatment. Some new evidence suggests that if a transport will last for more than 12 hours, blood washout may actually be counterproductive. We may achieve better results by leaving the patient's blood undisturbed, so long as it is treated aggressively with Heparin and other agents to prevent clotting and agglutination. This would greatly simplify the transport protocol.

Another proposal has been made by perfusionist Steve Rude, who consults for Alcor on a part-time basis. He suggests that we should use a heart-lung bypass machine to maintain blood circulation and oxygenation for up to two hours, with virtually no cooling at all. Steve believes he can cannulate a patient quickly enough to establish bypass while the patient is still in a hospital bed, if the hospital will cooperate. This would completely eliminate our current system using mechanical CPR and an ice bath, which is heavy, cumbersome, and hazardous to personnel, since the sprayed cooling water creates problems in infection control.

I'm hoping to obtain more evidence on these competing protocols, so that we can modify Alcor's transport procedures as quickly as possible.

Meanwhile, I discovered that we had immediate health emergencies to deal with. I was worried to learn about two possible future cases, one in upstate New York, the other in Florida. The New York case was a source of special concern because it would entail many logistical problems. Also, the patient's husband was a professional surgeon, who might judge Alcor's procedures harshly, especially since he and his wife had no former experience with cryonics and might be expecting a lavishly funded network of full-time staff, reminiscent of the fictitious cryonics organization in the movie *Vanilla Sky*. We are still too small to fulfill such grandiose dreams. As things turned out, the patient

died before she completed her paperwork. I was sad that we lost a life that might have been saved, but I was not faced with the extreme difficulties of providing good service at a remote location.

I faced yet another priority in California, where a longtime cryonics advocate, whom I have known personally for ten years, experienced medical complications in a hospital where he had been admitted for hip surgery. While Russell Cheney, Mike Darwin, and Bobby June rented a van and stocked it with an ice bath, oxygen bottles, and other essentials, I reserved rental cars, seats on airplanes, and rooms in nearby motels, and I created a schedule. We maintained a standby on a 24-hour basis with help from the California team members I had met previously, plus Tom Brown, James Sikes, and myself (all from Alcor), David Hayes (from Suspended Animation), and Mike Darwin and Regina Pancake—a longtime California member who has decided to become more involved. After three days the patient's daughter decided that her father had passed through the period of major risk following surgery, and we ended the standby but left the fully stocked van in the hospital's parking garage, just in case.

I returned to my home in northern Arizona and started considering a tentative plan proposed by Alcor's vice president and treasurer, Michael Riskin, who is urging that we move away from the "pay as you go" standby system instituted by Fred and Linda Chamberlain to a standby system that will offer coverage automatically to all members who face a substantial risk of immediate legal death. The current system, which requires members to pay extra for standby service, has never been satisfactory because it doesn't fulfill the expectations of our members. Michael has done a very thorough job analyzing the costs of past standbys, and my only concern now is that future costs may not remain in the same general area.

The cryonics population is aging, and aging people tend to have more "health scares" that require temporary hospitalization. Does this mean we can expect more standbys in the future than we have in the past? Will a higher percentage of these standbys end with the patient recovering and going home, thus presenting us with the probability of another standby in the future? What will be the impact on personnel who already feel overburdened by the number of cases? Will we have enough money for future commitments if we base our calculations on past obligations?

I believe that Michael is absolutely correct that we need a better standby policy, so long as we can satisfy ourselves about the unresolved questions I have listed above. However, if we move from a policy where the member must decide whether to pay for a standby to a new situation where some costs are included and Alcor would have the burden to decide whether the standby should take place, it will entail a major shift of responsibility. If I deploy our standby services too readily, staff will burn out, and we will suffer financially. If I refuse to order a standby and the patient dies, I will feel a great burden of dismay and regret and will be blamed for making a bad decision. As always,

in cryonics, the stakes are very high.

Other issues also demand attention. Alcor's operating room is small, poorly laid out, and insufficiently wired for power. Recent cases have gone remarkably well despite these problems, but I have already drawn up a tentative plan for rearranging the operating room until we may acquire enough space for a second room. Also, Alcor should have a proper laboratory. Are these needs more urgent than the need for a cryotransport vehicle? Hard decisions have to be made, because we can't work on everything simultaneously.

Lastly, and most fundamentally, Alcor currently does not have a uniform protocol for cryonics cases. Various people have improved our procedures in various ways over the years. Different versions of transport manuals exist in various areas of the country, accompanied by different types of equipment. There's an urgent need for standardization, but this will require everyone to agree on what the standard should be. I'm looking forward to serving as an arbitrator in this debate, after which I hope to co-write an entirely new transport manual, which will be the basis for future training courses.

Yet another variable will be introduced to this equation. We have been told to expect a new and improved vitrification solution that will require us to modify our procedures, cooling the patient by an extra ten degrees on bypass. After that, we must consider whether intermediate-temperature storage is practical and affordable since it reduces the risk of cracking that happens as a result of thermal stress on the way down to liquid-nitrogen temperatures, below the "glass transition point" where vitrification occurs. During the next two months, a biophysicist who is deeply committed to cryonics will recommend a plan for intermediate-temperature storage, which we will evaluate as quickly as possible.

These challenges are augmented with lesser obligations such as developing a presentation for the 5th Alcor Extreme Life Extension Conference and mundane tasks such as checking all the transport kits, verifying the contents, and updating them where necessary. This kind of work obviously requires me to be present at Alcor Central, while the managing/planning work can be done via phone and e-mail from my home in northern Arizona, 140 miles away. I don't know yet whether I will be able to divide my time successfully between the two locations or whether I will need to move primarily to Scottsdale.

Regardless of my physical location, all my decisions will be based on one overriding priority. I want the best treatment for Alcor patients. That's why I accepted this assignment, and that's how I will measure my success. I invite you to measure it too, based on future reports of our work.

Some people have complained, in the past, of my "negative" attitude toward cryonics. But inevitably, nothing is perfect. Cryonics procedures are flawed with problems and deficiencies. I believe we have a primary ethical obligation to recognize and acknowledge these issues. Otherwise, we will have no incentive to correct them. I



Alcor

in the Media
Spotlight 

Normally when I arrive at Alcor to begin my workday there are two or three phone messages in my voice mail box. However, one morning in mid July there were more than 50 messages on my machine, and additional calls were coming in so fast that it was impossible for me to even check my messages! The majority of calls were from media representatives requesting a formal statement about a breaking news story. To assist with this flood of interest, a temporary agent was hired to act as Alcor's primary receptionist.

On average, Alcor receives 100 requests for our free information package per month. Within this single week, however, approximately 300 requests were received and by the end of the month of July the total number of requests exceeded 600! Needless to say, our temp agent and volunteers stayed very busy composing our free information packages and updating our central database with the contact information for these incoming prospective clients.

Before long, vans were lining up on the street and reporters were standing outside the entrances hoping to speak with any Alcor representative. Unable to leave without risking an appearance on the evening news, we had our lunches delivered, and security guards were kept on-site during business hours to answer the door and monitor the parking lots.

I devoted several hours a day to reviewing my e-mail, which was swamped with questions and comments from a multitude of people. Although some derogatory comments were made from individuals assuming the media had accurately presented the facts, the vast majority of messages were from individuals interested in learning more about Alcor's services. With my normal schedule disrupted in an effort to adequately address the high volume of questions, the membership growth rate actually slowed during July. Yet, I was able to recoup nicely in the month of August, with two new members approved per week.

I have heard the Alcor plight likened to a ship in turbulent waters. Those people on board are seeking a destination that has been imagined but not yet discov-

ered. Certainly, the month of July was an adventure, both scary and exciting at times. Now that the atmosphere has calmed somewhat, it seems as though all the activity has indeed made us stronger, even if only by increasing public awareness about our goal of life extension. It is my hope that this very public attention will motivate many more people to join Alcor in the coming months and years.

—Jessica Sikes

July Media Blitz

by Paula Lemler

The phone rang that morning around 6 a.m. For several hours after that my husband was not able to leave the house, because he was talking on first his cell phone, then the house phone, and sometimes both! I didn't realize I would become snared into this frenzy.

A couple of mornings later I drove to Alcor to bring coffee, bagels, and muffins. (Fifteen adults can put away a lot of food!) Fully expecting to see media trucks, I was surprised that there were none.

I took a look around the offices. This could not have happened at a worse stage in the remodeling, I remember reflecting. There was enough of the stone floor installed to see how gorgeous the completed work would be, but the marketing area was in turmoil. Okay, it looked somewhat like photographs of Beirut. The old ceramic floor had been chopped up, leaving an uneven floor, and the office furnishings, boxes, and stacks of books were piled in front of the windows, with a layer of white stone dust covering everything. No way could that area be used as a work space. Bruce Cohen helped me set up temporary quarters in an area near Joe Hovey's office, by placing a door (all had been removed to have the bottoms cut off) on a short file cabinet and a stack of boxes. I hooked up my computer, minus an internet cable but with electricity, and I was ready to work. Good thing I

had a phone, because the calls were starting to flood in. You can guess some of the many questions to which we had to reply that we could not reveal the identity of someone we may or may not have at our facility. The media blitz was beginning. When I arrived in the morning, I saw media trucks in the parking lot and reporters milling around. There were 30 or more messages on the marketing phones. We could not even listen to the messages because we were answering new calls. Pads of yellow lined paper filled up. Soon, a temporary agency was contacted, and we had a wonderful woman answering some of the calls and logging them into a computer. These were printed and put into ring-binder notebooks for Karla Steen and Bill Haworth. Many requests for membership information were entered into the computer too. Additional information packets had to be put together. And all the while, our regular work still had to be done. Conference registrations were taken, and other work on the conference progressed (mailings prepared, audio visual contract finalized, and so on).

The next issue of *Cryonics* magazine was to be mailed the middle of August, so all articles had to be sent to editor Lisa Lock by July 24. Dr. Lemler had told the staff he wanted the magazine back on schedule, so that's what we did. Everyone on the Alcor staff put in long hours. This is often hard work, but it is rewarding, and I am privileged to know and work with such a dedicated staff.

I have a desk now, and no dust. The media situation has eased off considerably, but we still have filming crews coming in every week. Alcor will never be the same. Many, many people who were not aware of us now are. Perhaps we will get some new members from this publicity blitz, but more likely we won't see a big difference until much later. Most people need time to get used to the idea of cryonics. Progress has been made, though, in public awareness. Hopefully we have crossed the line from "weird science" to "unique science" or "futuristic science." That's progress, isn't it? 1

CryoSummit Report

by Robert R. Newport, M.D.

The world's first harmonious gathering of cryonics organizations took place in Michigan this summer after the presidents of the two major groups, Robert Ettinger and Dr. Jerry Lemler, opened a dialogue last year and found each other to be rational and civil. The conference proved to be more than just an exercise in diplomacy, as the momentous media events of this past summer have had a major impact on all the cryonics world, bringing a great influx of attention (both positive and negative!) to all involved.

Hospices: Alcor's New Addition

by Tom Brown

One of my duties for the Alcor Foundation is to secure hospices for our members. Over a recent six weeks I traveled to New York City and Los Angeles. The four hospices that I have secured have shown the desire and dedication to work with us under difficult circumstances. They are East End Hospice, Hospice of New York, Compassionate Care Hospice, and Cedar Sinai Medical Center Hospice. It is my intention to use them as a springboard for education on cryonics. My initial goal is to facilitate patient care and provide emotional support within the confines of the hospices.

As part of the Alcor team, I look forward to helping our members and serving their needs. In just a few short weeks, I have already referred two members to Cedar Sinai Medical Center Hospice. I also plan to work on Alcor's affiliation with hospices in southern California, Hawaii, Texas, Florida, Washington, Oregon, and Massachusetts. Once I have succeeded in these areas, I plan to expand into other metropolitan areas across the country. I know the future will provide new opportunities for our members. As always, my objective is to create and anticipate our clients' needs.

If you would like further information about our hospice affiliations, please feel free to contact me. I can be reached at 480-905-1906, extension 112. I will be glad to send you a booklet on a specific hospice or answer any questions you may have. 1

Attending the conference were 16 delegates representing five organizations, including John Besancon (Cryonics Institute [CI], Director), Ben Best (CI, also representing the Cryonics Society of Canada), Hugh Hart (CI), Bill Haworth (Alcor, Public Relations Manager), David Hayes (Suspended Animation, Inc. [SA], CEO and CFO), Pat Heller (CI, Director), Hugh Hixon (Alcor, Board Director and Facilities Engineer), Joseph Kowalsky (CI, Vice President and Director), Dr. Jerry Lemler (Alcor, President and CEO), Judy Muhlestein (Alcor, Advisory Board Member), Dr. Robert Newport (Alcor, Medical Advisory Board Member), David Pascal (CI), Dr. Yuri Pichugin (CI, Director of Research), York Porter (CI, also representing the Immortalist Society), Michael Riskin (Alcor, Vice President and Board Chairman), Nolan Shaw (CI), David Shumaker (SA, President and CEO), Edgar Swank (American Cryonics Society [ACS], President),

Jim Yount (ACS, COO), Andy Zawacki (CI, Facilities Manager).

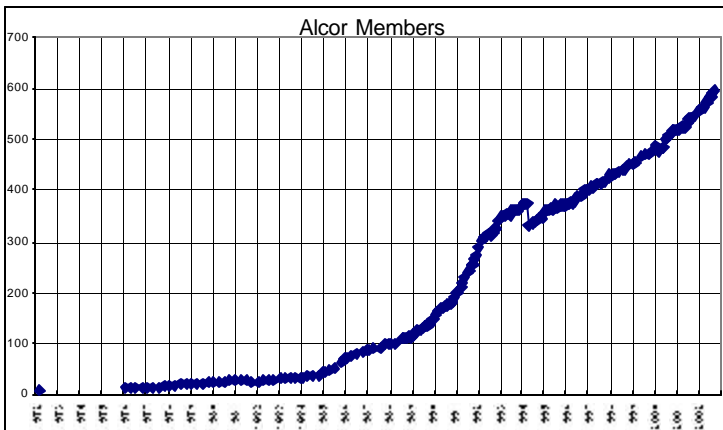
The delegates met over three days. Both in response to the need to present a rational front to the world and to support one another in the face of increased interest in the field, they agreed to establish an international association of organizations, IACO, which among other things would write standards—ethical and procedural—for the industry and ensure that all members meet those standards. This was seen as an absolute necessity as we will no doubt soon be under the scrutiny of federal and state regulatory agencies. If they find that we have already done their job, they will not be motivated to do it for us. Other areas where such an organization might be useful include promoting mutual cooperation and coverage in rescue and emergency situations and finding other areas where sharing resources might improve

our efficiency. Dr. Robert Newport, Dr. Charles Tandy, David Ettinger, and David Shumaker were appointed to a steering committee to actualize this plan.

All the delegates felt that the level of cooperation and quality of communication warranted making the Cryosummit an annual event, and Alcor's President, Dr. Jerry Lemler, volunteered Alcor as next year's host. I wish to thank CI and their entire delegation for their wonderful hospitality (which included, not least of all, great food!), and I am looking forward to the exciting times ahead for our entire industry.

Membership Update

This is a historical graph of Alcor's membership growth. Our current plans are to provide an updated version in each issue of *Cryonics*.



Alcor Membership Status

Alcor has 600 Suspension Members (including 105 Life Members) and 49 patients in suspension. These numbers are broken down by country below.

Country	Members	Applicants	Subscribers
Argentina	0	0	1
Australia	9	2	3
Austria	1	0	0
Canada	15	5	12
France	0	0	1
Germany	3	1	2
Ireland	0	0	1
Israel	1	0	0
Italy	0	2	3
Japan	1	1	2
Korea	1	0	0
Lebanon	0	0	1
Mexico	0	0	1
Monaco	1	0	0
Netherlands	1	2	1
Russia	0	0	3
South Africa	0	0	1
Spain	2	5	0
Sri Lanka	0	0	1
Sweden	0	0	1
Switzerland	0	0	2
Taiwan	0	0	1
U.K.	15	4	6
U.S.A.	550	66	241
TOTALS	600	88	284



The Normalization of Cryosuspension

by Michael R. Seidl, Ph.D., J.D.

Alcor and cryosuspension have recently received a tremendous amount of publicity as a result of the reputed suspension of Ted Williams. For the most part, the reporting appears to have been favorable—that is, either overtly favorable or at least neutral, with the occasional unflattering or overtly hostile report. Moreover, with a few exceptions, even the negative comments appear in the context of articles that have more balanced information as well. One of the most surprising things, from my perspective, has been the amount of discussion in the cryonics community over the use or harm of such publicity, good and/or bad, and the recurring suggestion that cryonics might be better off out of the spotlight. I disagree. Oscar Wilde once observed that the only thing worse than being talked about was not being talked about at all. The same, I think, is almost infinitely more true for cryonics—the only thing worse than bad press for cryonics would be no press at all. Media attention to cryonics—any media attention whatsoever—brings it to the table as a subject of discussion, places it, as it were, on the menu of choices rather than omitting it from the menu entirely, thereby increasingly and necessarily legitimizing and normalizing the practice. Individuals will always dispute matters of taste—that’s the purpose of variety on a menu—but as long as the option is on the menu to begin with, whether one person or another is critical or negative about the selection carries as much weight as the person who wrinkles his or her nose at the prospect of an escargot appetizer. The criticism then becomes “it’s not for me” rather than “it ought not be for anyone.” The recent publicity has demonstrated that, increasingly, cryonics is on the menu, and I have been amazed at the fact that all the up-turned noses in the critical press echo mostly the criticism “it’s not for me.”

Witness, for example, the parameters of the Ted Williams lawsuit in Florida. The dispute has been, is, and continues to be about Williams’s last wishes—did he wish to be cremated, as his will and some people state, or to be cryosuspended, as at least one other document made public and other people state? For the purposes of the Florida judge before whom the matter is pend-

ing and for the press reporting on the matter, the dispute might as well be over cremation versus burial—it is not the procedure that is at issue but the wishes of the deceased. That is wonderful, wonderful not for the parties involved who must endure public scrutiny of what ought to be a private matter, but wonderful for cryonics, which is legitimized by the field on which the dispute occurs. There has been no serious public suggestion other than that what should be done is whatever the executor or the court determine Mr. Williams’s wishes were.

I term what is going on here the “normalization” of cryonics, by which I mean the process by which something originally on the fringes moves toward the center through gradual public exposure and acceptance. Normalization cannot be forced. It can be supported by additional public exposure and careful efforts to portray whatever is being normalized (in this case, cryonics) as something quite ordinary. It can also be hindered by those who insist on emphasizing exceptional or unusual attributes. We ought all to be aware of our ability to assist or hinder this process. It is easy, given the promise of cryonics, to wax wildly optimistic, to discuss the prospects of human immortality, a fabulous future, travel to the stars, superhuman bodies, uploading, and interstellar society. Such speculation is fun, in the abstract, and exciting because it emphasizes the fact that cryonics is really something quite different, unique, unusual, but such speculation does nothing to normalize cryonics. Those possibilities are at the other end of the process, at the end of suspension and retrieval, and beyond even that, speculative and speculative sounding at best. In the short term, cryonics itself is quite ordinary and can be portrayed as such in order to assist its normalization. Although we do not want to suggest that cryosuspension is merely another mortuary practice—it is not; it is a medical practice about saving lives, not about disposing of bodies—it ought to be presented with the same matter-of-factness that mortuary practices are, as one of the alternatives to be selected from. Similarly, it can be presented as another item on the menu of insurance choices for the practical person—I buy auto insurance,

health insurance, dental and eye-care insurance, home/fire insurance, disability insurance, long-term care insurance, life insurance, and, finally, “death” insurance—insurance against death in the form of cryosuspension. Cryonics can also be presented as a relatively ordinary medical practice, the effort to put into practice the principle of “do no harm” in an extreme situation. By foregrounding the ordinary aspects of cryonics we move it—ordinary and unusual aspects both—more toward the center, toward the normal and everyday.

This process of normalization of the margins is recurrent throughout our society and history. A new idea—be it blood transfusions, or fast food, or heart transplants—begins new and fringe. As long as it exists only on the fringe there remains the possibility that it is going to be excluded entirely, that people will say “we don’t want that in our world” or “it’s wrong” or “it’s evil.” Given the lawsuits of the 1970s and Alcor’s adoption of the uniform anatomical gift act model, Alcor’s version of cryonics seems already to have passed that stage in the United States, although there is always the possibility of backward movement. Then, gradually, either through simple familiarity or because it is a good idea that people pick up on and want to take advantage of, the idea moves from the fringes to the center. Eventually, everyone knows about it, knows it is out there, and it becomes a viable selection on the menu of our melting pot society.

I recently visited Alcor Central. I love the fact that it is located in a Scottsdale business park and not in some isolated, fenced compound marked “No Trespassing.” Drug dealers and cults isolate themselves on the fringes of society; cryonics belongs in shopping malls. Placing cryonics in that environment makes the poles of the discussion “Buy it or don’t buy it; say yum or ewww.” Although sales are great, and ultimately necessary, in our market-driven society a necessary precursor to sales (and a guarantee of the possibility of sales) is that the product be on the shelf to be selected.

We live in a bureaucratic society, regulated administratively at the federal, state, and local levels. Cryonics cannot prosper flying under the radar; the war on drugs has shown us that planes that try to fly under the radar are tracked and forced down, their drug-smuggling occupants arrested, tried, and convicted. We need to register our flight plan just like everyone else, to be open, transparent, free to inspection and, if necessary, regulation and oversight . . . not because we desire the inspection, regulation, and oversight for their own ends but because it is what all legitimate, above-board organizations subject themselves to. Although our goals may be immortality and the stars, our game plan ought to be Wal-Mart’s. Alcor’s success in recent months demonstrates that it has internalized the business model and is moving increasingly and successfully toward that center position.

Given the new attention to cryonics, we must all be more careful than ever about the ways in which we discuss and portray cryonics in public. Cryonics has been a small club of enthusiasts. Now it is growing—moving into the public eye—and we

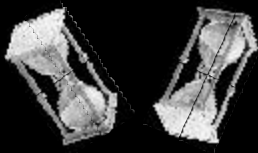
can no longer take for granted the sympathetic ear of everyone listening. We all must become spin doctors for cryonics—not in the negative sense of distorting the truth to our ends but in the positive sense of being attuned to our audience, knowing that the media likes to report the outrageous and may omit our careful comments in support of the science behind cryonics if we include with them the much more quotable “Oh, of course I expect to still be alive in four billion solar years, just not anywhere around here.” Our public utterances can help move cryonics increasingly toward the normal and everyday or can help hold us at the fringes; I prefer the former.

Increasing normalization of cryonics may help us in recruitment by encouraging a broader range of people than have previously expressed interest to consider it to be something that is properly on the menu for their consideration. Increasing normalization will certainly assist us in any future regulatory or legal action by helping to insure that the people involved perceive cryonics itself as a given and are interested only in disputing how it is done. In other words, in a world where cryonics has been normalized, regulation of the field will involve standards and protocols for effective suspension; in a world where cryonics remains on the fringes, regulation could be more—or absolutely—prohibitive.

. . . the media likes to report the outrageous and may omit our careful comments in support of the science behind cryonics if we include with them the much more quotable “Oh, of course I expect to still be alive in four billion solar years, just not anywhere around here.”



Ultimately, I find recent and increased publicity for Alcor and cryonics thrilling. Even so-called bad publicity is good for us because it puts us on the map as a subject of debate. The important thing is that we be the subject of that debate, invited to participate, be parties at the table rather than excluded from that discussion. When we come to that table, we ought to strive to appear methodical, reasonable, rational, and medical, providing a service that, certainly, is unproven in its end but completely ordinary in its methodology. If we are the snails of the medical menu, ordered by only a few, rather than the hot wings, we should remind ourselves to be grateful for the amazing fact that we have suddenly found ourselves on the menu at all.



You Only Go Around Twice

by Jerry B. Lemler, M.D.



Where's My Jell-O?

Tuesday morning, July 9, 2002, marked my second appearance on live national television. The CNN interview was completed in five minutes (not even time enough to get nervous), and my various sound bytes were aired all throughout the next 24 hours on the Headline News Network. I must confess I had little idea of the magnitude of the media onslaught I was shortly to participate in as I was compliantly sitting for makeup in a small anteroom of the Tempe, Arizona, studio, minutes before "show time." Our fresh-on-the-scene public relations counsel, the unflappable Bill Haworth, and Alcor's own Director of Marketing, Karla Steen, were (minimally successfully) most solicitous in their pre-game pep talk in order to allay my unspoken trepidations.

There are but a limited number of ways to say, "You'll be fine," though I have little doubt Bill and Karla employed them all. My overriding concern, especially prior to that first live interview, was not to say anything that would blatantly embarrass me or particularly the Alcor Foundation.

"No, Jerry, you won't do anything like that!" one of my prepping coaches would say, while the other nodded in silent affirmation.

"This is no big deal. You've done this before, a hundred times," was another timely remark I recall being given. And while technically this was true, I struggled to see the precise comparison between addressing the Maryville, Tennessee, Rotary Club Friday noon lunch group and the impending audience of millions. (I was later informed more than 20 million people had seen me at some point in time that day.)

Let's face it. This was a big deal! Though I may not have been as sharp as I would have desired (my media presentation standards are rather high), I was not displeased in the least by my performance. After all, I didn't make any horrific gaffs!

The following three weeks offered little drop-off in the intensity of my interview schedule. Media representatives of all stripes—television, radio, and print—were barraging our office with requests for a piece of the action. Of necessity, Bill and Karla skillfully apportioned my time (and theirs) to optimally portray our best side in each and every production.

Black and White and Read All Over

That same day, I wasn't able to watch either Dr. Ralph Merkle's outstanding performance on the *Wolf Blitzer Program* or Dr. Max More's stellar repartee on *Crossfire* (except later on videotape). Instead, my afternoon was spent at the Scottsdale Princess Hotel (there are worse places to hang out, of course) conducting a lengthy interview with *New York Times* senior correspondent Michael Janofsky.

Wednesday, July 10, front page of the *New York Times!* We had finally arrived! Mr. Janofsky had written a decidedly flattering article about Alcor, inclusive of my picture in the Patient Care Bay, prominently displaying our new logo and web site address on Bigfoot dewar number three in the background. Our spot as a prominent part of "All the News That's Fit to Print" was closely followed by a major front-page favorable spread in the *Boston Globe*. As far as my own schedule was concerned, Bill Haworth changed my focus decidedly toward radio and television. Before detailing these mediums, I should note that I gave interviews to two other major dailies—*The Arizona Republic* (Phoenix) and *The Miami Herald*.

What's the Frequency, Kenneth?

I was raised in New York, the primordial soup breeding ground of talk radio, and of all the various formats of expression, I am most comfortable in this medium. Without exception, the radio hosts I have visited have been courteous, if not flattering. I do hope you caught one of these broadcasts, as I have been on the air in San Francisco, Detroit, Dallas, Chicago, Salt Lake City, Denver, Edmonton, Albuquerque, Oklahoma City, New York City, San Diego, St. Louis, Toronto, and Stevens Point (Wisconsin).

Talking points on these shows have been wide-ranging—everything from the changing concept of death to Alcor's reasonable pricing structure through the life insurance option. On the Preston Pearson Sunday Morning Show on Dallas FM, I was pitted (without my foreknowledge) against Professor Craig Mitchell of a local seminary for an hour's moderated debate. I hope the former Dallas Cowboy's star receiver wasn't overly disappointed by my on-air effort to find (and voice) the commonality bridging our seemingly disparate points of view. Though

I rather doubt we'll see any dues payments coming from the professor anytime in the near future, I do declare by the end of the hour he was far less dismissive of cryonics than when he first took to the mike.

What Happened to You?

One positive result I gained on account of all the recent notoriety was being contacted by several long-lost family members and high school buddies, some of whom I haven't conversed with in more than 30 years. My paternal first cousin once removed, Patsy Weiner, called from Palm Beach, Florida (home of the infamous Butterfly Election Ballots), and I learned she and her husband, Laz, had become grandparents to four (teen-age) children—now twice removed. Nathan Devore invited me to dine with him in New York whenever I should return, and one of my closest New Rochelle High School chums, Steve Koff, saw our front-page article in the *Boston Globe*. After issuing the appropriate congratulations, he reflectively asked, "What happened to you? I used to think you were sort of normal." I reminded Steve of the time he had driven his fist through the dashboard of Billy Stark's old Studebaker when he heard his beloved New York Giants pro football team had lost a game to the Green Bay Packers. Dr. Koff now practices dentistry in the Boston area.

The View from the Peanut Gallery; or "Hey Kids, What Time Is It?"

I must admit, I've had (from nearly the beginning) an unusual relationship with television. It actually started in the summer of 1949, a scant few months prior to my birth. Before the era of the national fast food chains, my paternal grandfather, Harry Lemler, owned and operated a host of New York City luncheonettes and, due to his tenacity, hard work, and enterprising spirit, had acquired more than a few shekles. In July of '49, two visionary gentlemen of means approached my grandfather and offered him a one-third interest in a new magazine they were planning to publish. The investment buy-in price was \$10,000, quite a hunk of change back then, of course. Regrettably, Harry believed television would be no more than a passing fad, and right-minded people would grow weary of the new gadget and turn back to the radio. Thus, he rejected the offer to become a 33.3 percent owner of *TV Guide*!

In spite of my grandfather's pronouncement, the television industry did indeed flourish, and this summer the cameras were certainly focused in our direction. Aside from the opening day CNN blitz, I appeared a couple of nights later on the *NBC Nightly News with Tom Brokaw*. The following week, Bill Whitaker and his crew conducted a lengthy interview of me (and several other Alcor staffers and volunteers) for airing a couple of weeks later on the *Charles Osgood CBS News Sunday Morning* program. We also granted a major TV spot to a Korean network, and MTV came to film us for their Urban Legends series.

I mentioned (quite correctly) at the top of the piece, that the initial CNN interview that kick-started the recent media feeding frenzy marked my second national television appearance. My baptism into "stardom" actually occurred some 47 years ago, in 1955, at the tender age of six. My parents had relocated us from

West 83rd Street in Manhattan to the nearby bedroom suburb of New Rochelle the year before, and that's how it all began.

The proprietors of the local childrens' shoe store happened to be none other than the affable Mary and Vic Smith. While Vic, sure enough, was on his way to a none-too-modest income hocking those Keds and Stride Rites, his primary recognition (at least amongst his wee patrons) came on account of his little brother, Bob.

I promise you, no bug-eyed six-year-old kid could have possibly been any more excited than me, as my mother drove us into the city to the studio to appear on TV with Bob Smith. And, not only was I going to be on television, but Vic had arranged for me to meet Buffalo Bob and sit next to him in Howdy Doody's infamous Peanut Gallery!

To the day I'm cryosuspended, I'll never forget the first words Buffalo Bob Smith said to me as I was ushered into his dressing room prior to the show. As I entered the highly luminated quarters, he placed his meaty hands on my shoulders, looked me in the eye, and said, "Hey kid, do you like Jell-O?"

I was stunned. I couldn't imagine why my boyhood demigod, dressed in his customary oversized cowboy outfit, would care about my culinary pudding preferences.

"Sure," I meekly responded, too dumbfounded to utter anything more loquacious.

"That's great!" the tasseled TV cowboy retorted, and then I was placed next to him stage left, in the Peanut Gallery.

Somewhere in the middle of the program, he and I did a commercial, sure enough, for Jell-O. Buffalo Bob spooned up a morsel of the delectable cherry (that's the only flavor they produced back then) confection and offered it to me.

"Isn't that delicious?" he pleadingly asked.

"Mmmm. It's great," I answered on cue.

There were no post-commercial interviews for me to give, and (not unexpectedly) I was never compensated for my determined effort, save for a small carton of the red stuff to take home. I was, though, for that brief Andy Warhol moment in time, a bit of a celebrity back in New Rochelle on my next visit to Mary and Vic's shoe store.

This summer's media blitz has (no doubt in my mind) been an enriching experience for our discipline and our foundation. I am unable to express these virtues any better than Michael Seidl has done (see p. 24), so I won't even make the unworthy attempt. What I will say, though, is that from a purely personal perspective, it has been a rapid fire series of exhilarating experiences. And if the truth be told, it was infinitely better than a spoonful of Jell-O and an afternoon in the Peanut Gallery with Buffalo Bob! 1



Young Dr. Lemler displays his enthusiasm at having discovered the pleasures of chocolate chip cookies.



Prehoda's Challenge to Cryonics

by R. Michael Perry, Ph.D.

The last "For the Record" column (1st Qtr 2002) covered Robert Prehoda's efforts in the 1960s to interest the scientific community in suspended animation, which he thought could be achieved through cryogenic preservation, but only if a massive research effort were undertaken to perfect the then-primitive techniques. Prehoda was both scientifically trained and articulate, and his well-stated opinions are worth considering today for much more than purely historical reasons, even if some of his reasoning is dated or otherwise flawed. (As one indicator of relevance, our techniques today are still unacceptably primitive, inasmuch as there is no demonstrated, reversible cryopreservation of large tissue masses or sizable organisms.) As noted last time, he was strongly opposed to the newly introduced practice of cryonics, which he thought to be premature, futile, and fraudulent.

"Robert W. Prehoda,"
Cryonics Reports 4, no. 1
(January 1969): 8.



Prehoda's objections were first offered in a series of television programs and magazine articles and then more definitively in "The Lunatic Fringe," chapter 8 of his 1969 book, *Suspended Animation*. There is some further elaboration in the chapter that follows on the freezing of James Bedford in 1967. It is now time to take a closer look at this critique. It is worth remarking that, despite its negativity, there is no indication of malicious intent. Prehoda, by appearance, was sincere and believed he was presenting issues fairly. We need to consider his arguments objectively and ask whether they might have substance. As it hap-

pens, this was done long ago, which lessens the burden on hindsight. Robert Ettinger anticipates and in some measure rebuts Prehoda's objections in his own, well-known volume, *The Prospect of Immortality*, which appeared in 1964. (In fact, the two had communicated prior to the publication of either's books.) There is further discussion and rebuttal of Prehoda's position in the pro-cryonics newsletter, *Freeze-Wait-Reanimate*.

The opening sentence of "The Lunatic Fringe" sets the tone for what follows: "For the past six years, serious scientists engaged in reduced metabolism research have been confronted by the unexpected emergence of a pseudo-scientific cult which is presenting a completely distorted picture of the prospects for suspended animation to the general public." The "cult"—in this case, the newly formed cryonics movement—had by then achieved a few human freezings, a dozen or so, with great difficulty. It is worth noting that at least the frozen were, by and large, still frozen at this point, though one or two little-publicized thawings had already occurred. But criticism would naturally focus on scientific and technical issues at this early stage, a fortunate circumstance in view of the later failures. Prehoda limits most of his attention to these issues and to what he considers the unwarranted publicity of proponents, particularly that of the "revered prophet," Ettinger.

Science and pseudoscience receive their due, as they should, though one must keep in mind that the border between the two is fuzzy and dependent on what generally is considered to accord with reality. Opinions on the latter subject are mutable, and with them, the perception of what is scientifically legitimate, even among careful and objective inquirers. In 1800, for example, it seemed to many reasonable, thinking persons that life forms must have had an intelligent designer, while the notion that light could consist of particles and also of waves would have seemed preposterous and contradictory. Today the situation is entirely reversed, with creationism considered a pseudoscience and quantum physics, with its implications of the wave-particle duality of light, endorsed by the scientific mainstream.

This is not to say that one should be indifferent to the possible scientific demerits of a proposed endeavor or assume that

what one wants to believe is necessarily true or bound to happen. But scientific forecasting is especially tricky, even as it is also especially important in cryonics, where we wonder quite earnestly if our procedures will work as intended. “Experts” have often been confounded by developments they were confident would never happen. This must be kept in mind when assessing possible future capabilities.

Prehoda defines a “pseudo-scientific proposal or idea” as “a hypothesis or combination of hypotheses which cannot be accepted by any of the leading specialists in the field.” For cryonics the “field” is cryobiology, and the “leading specialists” include such respected scientists as Dr. Audrey Smith and her co-workers, Sir Alan Parkes and Dr. Christopher Polge, who pioneered the resuscitation of small mammals (hamsters) from partial freezing in the 1950s. No prominent cryobiologist had endorsed cryonics; Prehoda thus felt justified in labeling it pseudoscientific. (Negative comments from other scientific authorities are also noted.) Moreover, his objections do not stop with simple labeling, nor are they particularly dependent on specialists, beyond noting their lack of support. Instead Prehoda offers his own arguments, laying his groundwork with care.

He opens with a discussion of pseudoscientific movements in general and considers why they flourish in the absence of confirming scientific evidence or even in the face of contrary evidence. The primary reasons will be familiar to students of religion. Basically, people gain an important sense of meaning and purpose from certain beliefs, which may then override objections that others find compelling. It is not necessary that the beliefs themselves be false, of course, just that they be especially gratifying or meaningful to adherents and that there be evidence for these beliefs in some form that seems convincing enough to overrule any objections that others might raise. Forms of convincing evidence could include writings ancient or modern, personal experiences variously interpreted, reports of alleged experiences of others, arguments of one sort or other, or simply the existence of an endorsing movement or tradition. Sometimes, though not always, there are charlatans in a movement who knowingly make false claims or otherwise act to deceive the gullible.

In the case of UFO cults, believers may think that benign extraterrestrials are walking among us and about to usher in an era of world peace and brotherhood. Alleged alien encounters or sightings may be convincing, even if the world at large remains unpersuaded. Prehoda particularly notes the UFO cults as a modern counterpart to beliefs in angels or other spiritual beings. For some, claims of extraterrestrial encounters, while extraordinary, possess a scientific plausibility not found with angels and thus seem more credible. Because of the general skepticism of leading specialists such as astronomers, however, beliefs in alien encounters would qualify as pseudoscientific despite their grounding in presumed, nonsupernatural effects.

Pseudoscientific movements may be annoying in a minor way but, it may be asked, why get upset? No one is forced to subscribe to their tenets; few generally do. But Prehoda notes that such groups can impede legitimate science. UFO believers, for instance, often claim they have already achieved space travel

through their extraterrestrial contacts. A gullible public could then become less enthusiastic about bearing the considerable expenses of human-engineered space flight. (Though this is a plausible argument, Prehoda offers no quantitative estimate of the putative effects.) In the case of suspended animation, Prehoda fears a burgeoning “freeze now” movement that could convince the public that more research is not an urgent priority, inasmuch as hopes are based on existing procedures. Discouraging such hopes becomes a priority.

Prehoda then considers the specifics of cryonics, which were anticipated and delineated in *The Prospect of Immortality*. (The term *cryonics* itself did not appear until 1965, a year after *Prospect* was published. Coined by Karl Werner for the newly formed Cryonics Society of New York, the name was gradually adopted for general use and is now found in many dictionaries. Prehoda himself does not use the term in its generic sense but instead prefers “cryogenic interment.”) Near the beginning of *Prospect*, Ettinger sets the tone of his proposed program, in direct opposition to Prehoda’s: “It must be made very clear that our basic program is *not* one of ‘suspended animation,’ and does *not* depend on any special timetable of scientific progress, but can be instituted *immediately*” (emphasis in the original). Ettinger then explains his terminology: “Suspended animation refers to a standstill in the life processes of the body. It is a stasis which can be imposed and removed at will, and the subject is regarded as alive at all times.” Ironically, *Suspended Animation* is never quite as clear on this central subject, but Prehoda does offer a definition of “cryogenic suspended animation” as “the complete cessation of all metabolic activity for an indefinite period by means which allow future reanimation.”

It is important to note that the two understandings of “suspended animation,” while similar, are not identical—there is a crucial difference. Prehoda’s definition would qualify cryonic suspension as suspended animation, *provided it will work*. Under Ettinger’s definition, cryonic suspension is not suspended animation, *even if it will work*, because of the additional requirement that it be “a stasis which can be . . . removed at will,” something then (and still) impossible. Ettinger clarifies his position further, introducing another term that he calls *suspended death*: “the condition of a biologically dead body which has been frozen and stored at a very low temperature, so that degeneration is arrested and not progressive. The body can be thought of as dead, but not very dead; it cannot be revived by present methods, but the condition of most of the cells may not differ too greatly from that in life.” Suspended death, then, is distinct from suspended animation, in that means are not presently known for reversing the condition. It was the best that could be hoped for with cryonic suspension, and it is what Ettinger is promoting in his book.

Suspended death, despite its tentative character, is not simply the end of life but a possible gateway to future life, based on the hope that future technology will be able to restore the presently frozen to a functioning state. The existence of such technology would transform suspended death into suspended animation. Such a change would, in theory, require no new suspen-

sion procedures but only other, compensating procedures that must be developed. (In practice, of course, it is expected that suspension procedures will evolve and improve up to the point that resuscitation becomes a possibility. One must then hope that additional developments will make resuscitation possible for earlier cases preserved with more primitive techniques.) Ettinger, in fact, offers some thoughts on how resuscitation of frozen patients might occur, envisioning robot surgeons capable of superhuman feats of dedication and fine control. “[I]t is inconceivable that [such] huge surgeon-machines, working twenty-four hours a day for decades or even centuries, will tenderly restore the frozen brains, cell by cell, or even molecule by molecule in critical areas.” (We today, of course, are conditioned by the possibilities of nanotechnology and ask why the machines must be “huge” rather than tiny; swarms of intelligently controlled, artificial microbes seem more likely as restorative agents.)

Ettinger’s speculative thinking provides Prehoda a pathway for attacking cryonics, though also exposing weaknesses in his own position. He acknowledges that brain cells can survive cryogenic freezing (this was well-established at the time), but notes that such survival is rare, thereby concluding that the mind of a resuscitee “would be irretrievably lost.” What is glaringly overlooked is that the cells that do not survive might still be repairable, much as a car that will not start can often be made to run with the right mechanic’s attentions. As another possibility, information from damaged cells could be extracted and used in forming new, functionally equivalent cells. The brain might thus be rebuilt with its original memories intact, or largely so, even if few of its cells would “survive”—that is to say, spontaneously resume function on simple thawing. Instead, with the fixed idea that a blank brain is the best one could hope for, Prehoda wonders why any future society would “invest its resources in robot-surgeons that would spend days, decades or centuries constructing brains around the few cells that would survive.” To underscore this imagined absurdity he wryly adds, “we can obtain all the blank brains we want in only nine months, using unskilled human labor!”

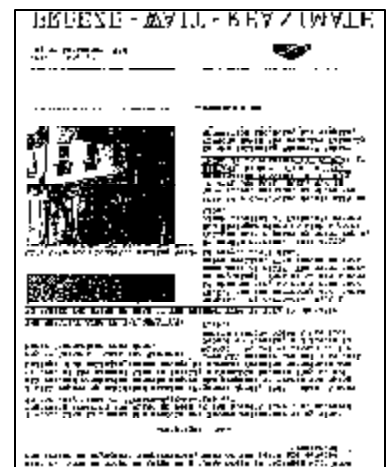
In assessing the validity of the cryonics premise, a critical issue is how memories are stored in the brain, an area where understanding is still inadequate and divergent views are held. Many feel, for instance, that the long-term memories that would be important for recovering the personality reside primarily in the synaptic connections between the neurons, but this is not the only view. An alternative that is favored by Prehoda in his book is to credit specially configured strands of RNA. According to this hypothesis, these memory molecules are present in large numbers in the brain’s neurons and must accordingly be restored if a prospective resuscitee is to retain any sense of her original self. On this latter possibility Prehoda is characteristically doubtful. “The memory RNA within many of the brain’s neurons would be altered or damaged by present freezing techniques. The robot surgeons would have no way of knowing the precise structure of these trillions of altered RNA memory molecules before they were frozen.” Ettinger notes, however, that memory is highly redundant, however it may be encoded, which should materially

lessen the dependence on “precise structure”—much as a book might be reconstructed from a number of damaged copies.

Another issue involves the “six minute limit” beyond which, Prehoda tells us, a person experiencing oxygen deprivation generally loses his memory and intelligence, if he survives at all. The effect can be mitigated if body temperature drops quickly, as in cold water drownings, but such favorable conditions will often not be present when a person is cryopreserved. Prehoda assumes that the information loss is total and permanent; the brain, then, is quite a fragile organ, and trying to preserve its fine structure after clinical death is, at best, highly problematic. Ettinger also considers this problem, but reaches more optimistic conclusions. Many human body cells, he notes, are shown to resume some function up to a day or two after death, suggesting that the injury to brain cells might not be so severe as to obliterate the encoded memories. On the other side of the coin, starting suspension procedures immediately after death would be feasible in many cases, to minimize any deterioration.

Prehoda’s feud with cryonics started in 1963, when he, a respected scientist, received a pre-publication version of *Prospect* for evaluation. Though impressed with the colorful writing style, he took issue with the “freeze now” concept and tried to persuade Ettinger to drop it. Ettinger refused, and, after the book was commercially published the following year, Prehoda became a leading voice of opposition. In its April 1966 issue, *Pageant* published an article by Prehoda contending that perfusing and freezing a large organ such as a human brain would damage most of the cells “beyond any conceptual means of future repair and restoration to original function.” He was certain that “[t]he very process of attempting to repair billions of separate brain cells would necessitate separating them, and this would sever intercellular connections that would be almost impossible to rejoin.” The odds of completing such a repair task he estimated at “less than one chance in ten trillion.” Of the leading cryobiologists he said that “[n]ot one of them thinks there is even a remote chance of reanimating people frozen under present cryobiological techniques.”

Prehoda’s article and other cryonics criticism was covered in the August-September 1966 issue of *Freeze-Wait-Reanimate*, the newsletter of the pro-cryonics Life Extension Society, founded in 1963 by Evan Cooper. In his reply Cooper notes an experiment of Isamu Suda and colleagues at Kobe University in Japan. A cat brain perfused with a glycerol solution was chilled to -20°C for more than six months, then reanimated with recognizable brain waves. Cooper surmises that “it might be extravagant to claim that most of



the cells would be damaged beyond any conceptual means of repair.” Ettinger in the same issue disputes Prehoda’s claim that the leading cryobiologists all discount any chance of reanimating persons frozen with current techniques. Instead, of the ones Ettinger had corresponded with, including some of the best known, “not one denied that there is some chance of eventual revival.” He also tellingly notes that “poll taking is an art, and the answer you get depends on the way you ask the question.” Finally, Ettinger takes issue with the low probability estimates of Prehoda and others, arguing that they have not done any calculations but have only given in to emotional blocks.

With all his resistance to the concept, it is perhaps a strange irony that Prehoda was involved in the freezing of Dr. James Bedford on January 12, 1967—an event usually regarded as the first true cryonic suspension. Prehoda’s participation is recounted in chapter 9 of *Suspended Animation*, but it did not imply that his opposition had weakened. Instead he tells how he tried hard to dissuade Bedford’s son, Norman, from proceeding with plans for the freezing when the senior Bedford was terminally ill. Failing that, Prehoda reluctantly agreed to be present as an observer to provide the son with a report, which involved taking photographs. Dr. Bedford had set up a foundation to conduct research into suspended animation and wanted to be part of an ongoing experiment, even to the point of his own reanimation, if that should ever prove possible. The report and photos were needed for documentation.

“Robert Nelson at Bedford freezing, January 12, 1967. This posed shot shows a simulated injection of cryoprotectant into the patient (Bedford). Standing behind Nelson is Dr. Dante Brunol, a perfusionist who assisted with the freezing (though Bedford was not perfused).” From *Cryonics 12*, no. 7 (July 1991): 15.



The family, however, wanted no publicity and did not want the patient’s identity disclosed. Prehoda relates that the pictures that were taken were the legal property of the Bedford estate and should have remained in private hands. Instead, through an oversight, a roll of film was left behind when Prehoda packed his gear early the next morning and headed home. The film found its way to the “true believer” Robert Nelson (whose organization, Cryonics Society of California, had sponsored the freezing) and was then sold to *Life* magazine for the reputed sum of \$5,000. Meanwhile the patient’s name was ferreted out by the ever-inquisitive press, much to the family’s discomfort, and an article on the Bedford freezing appeared in one version of the February 3, 1967, edition of *Life*. The press run of this version was quickly stopped, however, because of the Apollo fire on January 27, in which three astronauts lost their lives, and an article on that disaster was substituted. Muted though it was, the

publicity success of the Bedford story incensed Prehoda. He considered it “a small degree of poetic justice” that the Apollo disaster occurred and affected the magazine when it did, so that “[o]nly one million copies of that issue included the freezing story.”

The fury over the missing pictures is understandable, particularly in view of other details Prehoda relates, such as Nelson’s claim of having paid him for the pictures, which Prehoda denies, and the perceived role of Ettinger and others in making the freezing into a media event. But Prehoda’s reactions also underscore an issue that is raised by his very opposition to cryonics in the first place. It has to do with how we value human life. Cryonics is about saving lives, whatever one may think of its chances of success. It may not work, but otherwise the lives will be lost in any case. One can take the view that only human life or society as a whole, or certain groups, have substantial value, that individuals, by comparison, are unimportant. This collectivist attitude can extend significantly to oneself, so that there are limits to how much one’s own survival is valued.

A serious collectivist, we would expect, would not be much interested in personally signing up for cryonics, or advocating it for the general public, so long as major doubts could be raised as to its workability. If such a person had a scientific bent, he might be much more interested in researching the problems with cryopreservation than in any program to use the best current techniques to preserve those dying today. This, then, seems to be where Prehoda was coming from. Of course, it was Prehoda’s contention that cryonics had essentially *no* chance of working, so that opposing it in no way implied any callousness about human life. Yet he would characterize as “poetic justice” an incident in which innocent people died by fire, again suggesting that concern over the individual was not a strong priority. On a personal level, I found Prehoda civil and considerate (this despite his drinking problem), treating me to dinner when I interviewed him in 1991, and amiably pointing out various places of interest in the Burbank, California, area. He did not come across as an ogre with no conscience. At the same time, like so many others, he no doubt had long since accepted mortality as an inescapable fact of existence and did not want to incur the emotional burdens of trying to challenge it, at least until substantial progress could be made in addressing the problem.

The commitment to a mortalist view, of course, carries its own reinforcement to anyone professing a conscience. In rejecting what some say is a possible life-saving measure, one does not like to be proved wrong. It then becomes difficult to acknowledge that the other side may in some measure be right, or to view their arguments with full objectivity. We in cryonics, at least, are fortunate in not having that problem. Yes, we *could* be wrong; Prehoda and the many other nay-sayers could be right after all. If so, well, we tried, and, if still around when the truth is known, we can then go on to other things. We can in any case look the opposition in the eye today, with full objectivity, and not worry that we made some terrible mistake in which lives were need-

(continued on page 33)

Letters to the Editor

Dear *Cryonics*:

I'd like to comment briefly on Rick Potvin's article, "An Introduction to Classical Futurehumanism" from the 1st Quarter (2002) issue of *Cryonics*. Overall, I saw in the piece a constructive effort to suggest a way we might increase our sign-up rate, by becoming involved with a certain group he calls Classical Humanists, who might be well-disposed if we present our case in the right way. Classical Humanists, it appears, want to do good works to benefit future generations and thereby achieve an enduring reputation and gratitude. This for them is "immortality" but not what cryonicists would consider the genuine article, since we want to personally survive or somehow be present and conscious in the future. The Humanists in turn are generally not interested in personally extending their lives, at least not in the substantial way that we are aiming for. If we seek to join forces with them, and show that we are interested *both* in extending our

lives *and* doing enduring, good works (thus establishing ourselves as Classical *Future*humanists), then we may persuade them to take interest in extending their lives, and thus, to join our ranks. I think this has been tried already. For instance, the Venturists are interested in the kind of good works Potvin refers to, and they are also cryonicists. They have contacted advocates of humanism to try and interest them in cryonics. But so far our success (I am a member and director of the Society for Venturism) has been minimal. This is not to say that it must be so in the future; certainly efforts of this sort should continue. But my feeling is that the divide between those who are and are not seriously interested in radically extending their lives is rather deep and will not be easily bridged, even when other interests coincide.

—Mike Perry

Dear *Cryonics*:

The recent issue of *Cryonics* (23:1) says next to nothing (that I was able to find) about the rationale for choosing a new logo for Alcor, or how the decisions were made. So I also do not know to whom I should send this message. But I trust that you'll forward this to whomever ought to see it.

I have to say that I find the new Alcor logo just terrible. I do not see why the old logo was deemed unsuitable. I kind of liked it a lot. The re-emerging of the phoenix/birdlike creature looked kind of cool, and it now has an interesting double-meaning, given that you guys are now located in the Phoenix, Arizona, area.

The new logo, however, is just shocking. For one thing, triangular shapes of this kind signal "danger"; all kinds of warning signs are triangular. To me, the new logo looks more like a bio-hazard sign than anything else. (By the way, the old IMM (Institute for Molecular Manufacturing) logo of around 1992 had the same problem. Fortunately, I was able to get it changed to a more benevolent design.)

Additionally, the jagged appearance and sharp spikes of the new logo suggest "ice crystal" to me, which is what you exactly would want to avoid.

Could you guys please revert to the old logo, or redesign the logo, before too much public image damage is done? Or could you at least subject the logo issue to some discussion among Alcor members and some voting?

Thanks for your consideration.

Regards,
Markus Krummenacker
Alcor Member A-1740



Dear *Cryonics*:

I am writing to express an opinion about the new logo. I'm afraid I must say that I don't like it at all. I urge a return to the previous Alcor logo with all possible haste.

The new logo is dull, brusque, and inelegant. But most importantly, it is meaningless. Anyone seeing the logo would have no idea what Alcor was about. The previous logo is striking and beautiful, possesses valuable mindshare due to the years that it has been associated with Alcor, and carries with it a timeless and evocative symbology.

The previous logo is one I would be proud to wear and display. The new logo does not signify or inspire anything.

I hope Alcor will consider switching back to the previous logo.

Thank you,
Ka-Ping Yee
Alcor Member A-1679



Dear *Cryonics* and Alcor Members:

As you know, Alcor has been going through many new and exciting changes over the last few months from both a business standpoint and a marketing standpoint. From a newly designed web site and company logo to a brand new interior design for the Alcor offices, the new changes at Alcor can be seen everywhere. It is an exciting time.

This letter is meant to address one aspect of the new changes at Alcor from a marketing perspective—the new Alcor logo. As the advertising and creative design agency responsible for developing the logo with Alcor, we have heard from a few Alcor members who have given us input on the new logo, and we always appreciate the feedback.

As an advertising agency, we understand that change is not always comfortable, usually never easy, and certainly won't always make everyone happy when it occurs. This is certainly the case when it comes to designing a new logo for any company. Although the response to the new design has been very positive, perhaps we should give the members some details on how this all came about.

The new corporate image and logo that we designed for Alcor involved a lengthy process that spanned several weeks, more than 40 different designs, and collectively involved everyone on the Alcor staff. The final design phase narrowed the field to about 15 or 20 designs that everyone on the staff then voted for. The new Alcor "A" was chosen to be the new logo from that interactive process involving all Alcor staff members.

We believe, as do many, that the new logo design creates a unique branding initiative for Alcor and reflects a new forward momentum for the company as they head into the exciting future of cryonics. As with anything new or different, we know people's opinions will vary, and we respect that there will be varied tastes when it comes to art or even corporate identities.

The new Alcor logo has proudly been displayed on television and in newspaper, magazine, and internet articles all over the world and has become an integral focal point for much of the Alcor marketing literature. From all accounts, the goal of repositioning Alcor and strengthening its branding through the new corporate logo is being achieved with great results.

We hope this sheds some light on the design process and thank everyone for their input so far.

Best Regards,

John Bevens
Sr. Creative Consultant
Media Architects

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lessly lost. In particular, it doesn't seem likely, contrary to Prehoda's fears, that our "freeze-now" movement has impeded scientific progress, at least in any overall sense. I think a good case could be made that the very opposite has occurred, as is seen, for example, in the cryobiological work of 21st Century Medicine, with its known ties to cryonics advocates. And, glorious to contemplate, we might be right, as I, for one, think will substantially be proven to be so.

In any case we are surely on the right track. We are still here doing our thing, our movement stronger than ever. More than one prominent cryobiological researcher is presently signed up for cryopreservation, to deflate Prehoda's claim of our being pseudoscientific, for what that is worth. Cryobiology in turn is not the only relevant field. Included among the cryonicists are noted representatives from two other important fields: nanotechnology and artificial intelligence. Both, we expect, will play an important part in any proposed program of reanimation, and both are useful today in making the case for cryonics more credible. (In particular I note the optimistic projections of nanotechnologist and encryption expert Ralph Merkle, who is now a longtime cryonicist and who thinks the procedure has a good chance of working.) Prehoda meanwhile is long forgotten, with no one else to further his cause of suspended animation, except, ironically, ourselves and our sometimes-disparaged movement. And so in some measure we become his minions—though with an important difference. Yes, our hopes of defeating mortality through our practices are serious, and this is an important source of meaning. But it also supplies a motive that otherwise would be lacking, one whose absence would, I think, greatly slow our progress toward suspended animation, or, more likely, terminate the effort altogether. We must continue our work, *both* in doing research *and* in preserving our patients, using the best available methods when the need arises. 1

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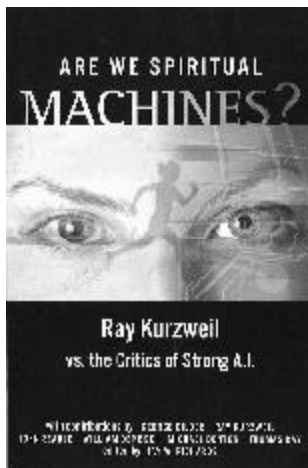
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Are We Spiritual Machines?: Ray Kurzweil vs. the Critics of Strong AI

By Jay W. Richards, ed.

Discovery Institute, 2002

Book Review by R. Michael Perry



Ray Kurzweil's book, *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*, appeared in 1999 (see the review by Thomas Donaldson, *Cryonics*, 4th Qtr. 1999). It advances the hypothesis that computers will, within a few decades, exceed present-day human intelligence. Meanwhile, in large part through this very progress, options will open for humans to enhance their own capabilities in unprecedented ways. Thus there is no requirement that people must be replaced by their machines, as some have feared, though indeed we will have to reconsider what it means to be human. Inevitably, we must come to accept a destiny of open-ended development, becoming more than what we now consider "human," that is to say, the biological entity *Homo sapiens*, with all its limitations. Among other things, we will be able to challenge the age-old problems of mortality and the predictable decline to death known as the aging process. The future prospects are clearly very exciting ones, and it is especially heartening to see them so optimistically forecast by the likes of Kurzweil, who is well-known for his accomplishments in such high-end computer endeavors as automated speech transcription, reading machines, and music synthesis.

Kurzweil's enthusiastic forecasting has inspired an expected backlash of controversy, particularly in view of his metaphysical outlook. That in turn assumes that true consciousness and feeling will have come to machines when they start exhibiting

the behavior expected from such enhancements, that is to say, when they cogitate and communicate in a way that convincingly mimics the human level. Machines will thereby become "spiritual" in Kurzweil's intended sense. In particular, we ourselves can be thought of as machines of a sort—spiritual machines of course—and there is no fundamental difference between our spirituality and that of future computers when, as anticipated, they are suitably programmed to perform as we now do, or better. This, allowing for some novel use of terminology, is essentially the position of strong artificial intelligence or strong AI, and is the point of contention in *Are We Spiritual Machines?* Kurzweil first details his position, with some interesting elaborations over his previous book; it is then assailed by some well-known critics of strong AI. Finally, Kurzweil takes the floor again and rebuts his opponents.

The gestation of the book, detailed in an introductory chapter by George Gilder and the book's editor, Jay W. Richards, offers additional insight into its contents. Gilder Publishing and *Forbes* magazine team up every September at Lake Tahoe to host the *Telecosm* conference, an event that "brings together computer and network experts, high tech CEO's and venture capitalists, inventors and scientists." Most of the panels deal with near-term prospects: new companies and emerging technologies; but the closing session is more philosophical and teleological in nature, with focus on a longer view. In 1998 the last session centered on Kurzweil's then forthcoming *Spiritual Machines*, and in particular whether our machines would one day become intelligent and displace us. Kurzweil himself advanced the idea that "integrated computer prosthetics"—human enhancements beyond mere genetic engineering—would be essential so that we could, in fact, keep pace with our developing technology and not be overwhelmed. Implicit in this thinking is the idea that artificial devices can be treated on the same metaphysical footing as our natural wetware so that, for instance, a part of the brain could just as well be made of silicon as protoplasm so long as it functioned equivalently. Kurzweil's position on computer prosthetics, an "affrontal idea," was challenged by a tough-minded panel of critics of strong AI, to wit, philosopher John Searle, biologist Michael Denton, zoologist and computational

evolutionary theorist Tom Ray, and philosopher and mathematician William Dembski. “This *Telecosm* ’98 session was so engaging,” write Gilder and Richards in their introduction, “and the issues it raised so important, that it deserved a wider audience”—thus the book was born.

Kurzweil’s own opening chapter, “The Evolution of Mind,” was interesting, I thought, because of its optimistic timetable: by 2029 “your average personal computer will be equivalent to a thousand human brains.” This will require developments both in hardware and software, which the author is confident will happen on schedule. One basis for his confidence is seen in Moore’s Law, in which certain measures of performance such as the amount of computing that \$1,000 will buy (measured in some standardized fashion) are seen to be growing exponentially with time. Moore’s law in a strict sense will probably putter out in a decade or so, when the technology it is based on reaches its limits, but new technologies will, in effect, continue it by other means. In fact, as time progresses, the resources devoted to computing themselves are increasing exponentially which, the author argues, actually leads to a *double* exponential growth of computing power (an exponential of an exponential). We thus could witness a fantastic, almost inconceivable improvement over a single human generation, and our deliverance could come very soon. “Could” is not the same as “will,” however, and it remains to be seen how the double exponential will actually hold up. Expected progress, over the long term, is really not even a single exponential but an S-curve that eventually levels off as laws of physics limit what is actually doable. (New laws or revisions that relax these limits are possible, but certainly not guaranteed.)

But, with deliverance—immortalization, godlike status, and so on—optimistically in his sights, Kurzweil argues we also need not fear a “takeover” by machines, since we will just modify ourselves to incorporate their superior capacities. This should be quite feasible once a mature nanotechnology is available. Brain and other enhancements should then give us far greater intellectual powers than we presently possess, and, in addition, make us physically almost indestructible and no longer subject to the debilities of aging. We will not lose our humanity, our spirituality, but only enhance it. Necessary to this view is the conclusion that we are presently, after all, machines in some basic sense. There is no fundamental difference, then, between human wetware and artificial constructs; performance determines the metaphysical status. Enter now the critics who challenge this view from various perspectives.

There is Searle with his well-known Chinese Room argument, in which a system can seem to understand something (Chinese in this case) but, he would say, actually have no understanding and just be “manipulating symbols” that can have no real meaning to the system. In a similar way, a system might imitate consciousness very convincingly yet have none whatever, again, just by manipulating meaningless symbols. Kurzweil’s interesting rebuttal includes the thought that the brain, with its biochemical pathways, is also “just manipulating symbols.” Its ever-changing, configurational details are as devoid of

intrinsic meaning—or as possessing—as details of comparable complexity would be in an artificial device that functioned at its level. In short, Searle is faulted, quite rightly I think, for failing to recognize that meaning can reside in *patterns*, whatever the “symbols” in which they are expressed. To his credit, Searle does make the good point that up to now we have not put much effort into designing systems that might be said to exhibit consciousness. So it is not surprising that our machines do a very questionable job of it (so far, but wait).

Other critics take issue with Kurzweil’s mechanistic assumption about life (Denton), and his non-theistic notion of “spirituality” (Dembski). Their arguments struck me as rather lightweight, worthy of inclusion for completeness, and not disprovable, yet not hard to discount. Kurzweil’s claims are similarly not (presently) disprovable and, moreover, are more in accord with accepted physical laws and the mainstream scientific worldview.

The other critic, Thomas Ray, devotes his main attention not to metaphysics but to certain assumptions needed for Kurzweil’s optimistic timetable. Human-level intelligence, Kurzweil tells us, can be achieved by copying nature’s masterpiece, the brain. Ray takes Kurzweil to task for vagueness as to the details of the proposed “copying” (how important, for example will software simulation be relative to the use of specialized hardware—an unanswered question). It is also noted that to really replicate the functioning of the brain we will almost certainly have to understand in detail how it works at every level, whereas Kurzweil seems to think that this full understanding will not be necessary. Ray leans toward the view that, while true artificial intelligence will be created, it will be alien intelligence, not closely matching human performance. It thus might complement human intellect but never integrate with it in the way Kurzweil imagines. Kurzweil’s rebuttal invokes the tremendous and accelerating progress being made in the area of neural modeling and his more general forecast of accelerating progress.

To me it seems likely that the brain will be successfully modeled, but it is still quite uncertain how soon it will come and if, in particular, the sort of progress Kurzweil imagines will be fast enough to rescue many of us now living. On the face of it, it seems that a staggering amount must be accomplished beyond raw computing power, high-level machine intelligence, or even nanotechnology capable in principle of remaking the body. Putting it all together, and actually saving and radically extending human lives, will take additional hard efforts while the intended beneficiaries—you and I in particular, if we live long enough—are sickening and failing as aging takes its toll. The scientific and technical difficulties are formidable enough, but political, ideological, sociological, and religious issues also come into play that could slow the effort beyond the critical time window. (So why not continue to hope for the best, but also be sure to choose cryonics?)

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The Fifth Alcor Conference on Extreme Life Extension



will be held at the Newport Beach Marriott Hotel, 900 Newport Center Drive, Newport Beach, California 92660. The Conference will begin with a reception the evening of Friday, November 15 and end Sunday, November 17, 2002. An intensive Tutorial on Fundamental Issues in Extreme Life Extension will be held on November 15.

Topics Covered

We live longer and healthier lives today than in centuries past because of remarkable advances in medical technology. We've already sequenced the human genome, cloned mammals, and replaced the human heart with an artificial pump. Soon we will understand the basic mechanisms of life. Not only is our understanding deepening, we are also gaining the ability to modify, control and repair the fundamental molecular and cellular structures from which we are made. Age and infirmity will become as rare as bubonic plague and smallpox. Youthful vigor and long-lasting good health will be the norm. How rapidly these advances take place and the extent to which we as individuals benefit from them depends very much on what we do. The Fifth Alcor Conference on Extreme Life Extension is a meeting of scientists and individuals who are working toward the expansion of human health and longevity. This conference will cover topics relevant to these pursuits including:

cryobiology
tissue engineering
cryonics
nanomedicine
genetic engineering

therapeutic cloning
vitrification
cryonics estate planning
anti-aging medicine
medical nanodevices

Also offered: A Tutorial on Fundamental Issues in Extreme Life Extension

Gregory Fahy and Brian Wowk—Extreme life prolongation at cryogenic temperatures
Ralph C. Merkle—Nanotechnology: How it will transform medicine and enable repair of cryopreserved tissue
Aubrey de Grey—Cancer, telomerase, and aging

Just Added!

A free-of-charge, open-to-the-public symposium entitled "Introduction to Cryonics and Alcor" presented by Dr. Jerry Lmler, Dr. Ralph Merkle, and Dr. Kat Cotter on Thursday evening, November 14.

Hotel

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Conference Sponsors:

Alcor Life Extension Foundation, Foresight Institute, and Future Electronics

This time, we welcome Gina Miller as co-contributor, and actually now, the principal author of this column. To help us keep up with the furious pace of research and progress she has generously made available her Nanogirl News [NGN] postings from Cryonet. These I have selected liberally from in what follows and sometimes lightly edited (some also had to be omitted for space considerations); a few additional contributions of my own [MP] are also included. (You'll also notice the individual pieces are shorter and more numerous, and generally consist of short quotations or slight adaptations from the original news items rather than rewrites; further information is, of course, available at the cited reference(s), normally a url.) Many thanks, Gina!—Mike Perry.

Silicon Quantum Computer

A quantum computer—a new kind of computer far more powerful than any that currently exist—could be made today, say Thaddeus Ladd of Stanford University, Kohei Itoh of Keio University in Japan, and their co-workers. They have sketched a blueprint for a silicon quantum computer that could be built using current fabrication and measurement techniques.

(*Nature* 6/19/02) <http://www.nature.com/nsu/020617/020617-3.html> [MP].

Reliable Performance from Nanotech

Sailors often took several clocks with them on voyages to try to minimize the error from any individual timepiece. Clocks are pretty reliable these days, but soon we may have to worry about defective microscopic machines. In the 8 July print issue of *PRL*, researchers take the first steps toward a plan for optimizing the performance of wildly uneven nanotech components, using statistical physics techniques. They find that defective parts can add up to perfectly good devices, with little or no waste.

(*Physical Review Letters* 6/24/02) <http://focus.aps.org/v9/st32.html> [NGN 6/27/02].

Nanotech Government Funding Approaches \$1 Billion

With its request for \$710.2 million in nanotechnology research funding for the 2003 fiscal year, the U.S. National Nanotechnology Initiative (NNI), the umbrella program coordinating nanotechnology research for ten government agencies, is accelerating its R&D efforts at an extraordinary rate. The program has grown more than five-fold since its formal inception in 1997, and in the President's budget, the NNI is requesting a 17 percent increase over fiscal year 2002.

(*IEEE* 6/27/02) <http://www.spectrum.ieee.org/WEBONLY/resource/jun02/nnano.html> [NGN 6/27/02].

Nanotech Drug Purification

Nanotech tubes could form the basis of new drug-purification techniques. When manufacturing medicines, it is especially important to provide a pure product. This task is often complicated because many drug molecules are produced in so-called chiral pairs (nonsuperposable mirror images) of which only one form is beneficial; the other may be useless or even harmful. A new technique detailed today in the journal *Science* provides a novel approach to this problem. Scientists describe a smart membrane containing tiny silica nanotubes that is capable of separating two forms of a cancer-fighting drug molecule.

(*Scientific American* 6/21/02) <http://www.sciam.com/article.cfm?articleID=000F1DCC-5639-1D12-8B07809EC588EEDF&pageNumber=1&catID=1> [NGN 6/27/02].

Ultrasmall Data Storage

Two University at Buffalo materials researchers have developed an extremely sensitive nanoscale device that could shrink ultra-high-density storage devices to record sizes. The magnetic sensor, made of nickel and measuring only a few atoms in diameter, could increase data storage capacity by a factor of 1,000 or more and ultimately lead to supercomputing devices as small as a wrist-watch, according to Harsh Deep Chopra, associate professor of mechanical and aerospace engineering, and Susan Hua, director of UB's Bio-Micro-Electro-Mechanical-Systems Facility and adjunct professor of mechanical and aerospace engineering, in the UB School of Engineering and Applied Sciences.

(University at Buffalo 6/26/02) <http://www.buffalo.edu/news/fast-execute.cgi/article-page.html?article=57590009> [NGN 6/27/02].

Cell Biology Tracking Tool

A team of scientists from Cornell University, US, has created a nanofabricated electrochemical detector array to help uncover the secrets of cell biology. The researchers used the device to look at exocytosis in single chromaffin cells. "Exocytosis is the mechanism by which cells release molecules such as neurotransmitters, hormones and various other compounds," said Manfred Lindau, an associate professor at Cornell.

(Nanotechweb.org 6/24/02) <http://nanotechweb.org/articles/news/1/6/16/1> [NGN 6/27/02].

Brain Implant Performance Boosters

New "fuzzy" polymers could improve the performance of electronic brain implants. Electrodes implanted in the brain may one day enable the blind to see and the paralyzed to walk. University

of Michigan researchers have developed a new polymer surface that could improve the interface between these implants and living tissue, enhancing the longevity and performance of the devices.

(EurekAlert 6/27/02) http://www.eurekalert.org/pub_releases/2002-06/acs-np061802.php [NGN 6/27/02].

Printing Computer Chips

Computer chips of the future could be printed, just like books or banknotes. A new laser-stamping technique could one day produce computer chips smaller, faster, and more cheaply than today's chemical-etching technology. With a transparent quartz die and a laser pulse, Stephen Chou and colleagues at Princeton University in New Jersey imprint features only 10 millionths of a millimeter (10 nanometers) wide onto a silicon wafer. The best photolithography can reproduce features about 130 nanometers wide.

(*Nature* 6/20/02) <http://www.nature.com/nsu/020617/020617-7.html> [NGN 6/27/02].

NIST Nanotech Showcase

The National Institute of Standards and Technology (NIST) opened the doors of its Gaithersburg, Maryland, campus on June 20 to share its work in nanotechnology with more than 200 researchers from industry, academia, and government. The Open House was one of four organized in the past year by the Greater Washington Nanotech Group, with the previous events taking place at the University of Maryland, the Naval Research Laboratory, and the National Science Foundation.

(*Nanotech-Planet* 6/21/02) http://www.nanotech-planet.com/briefs/article/0,4028,6551_1369831,00.html [NGN 6/27/02].

Spintronics: A Single-Spin Transistor

Spintronics is a relatively new field in which the electron's spin, not just its charge, can be exploited in devices and circuits. The ultimate spintronics degree of control would come from controlling a circuit at the level of a single spin. Physicists at the Institute for Microstructural Sciences (Ottawa) are the first to create a prototype of a single-spin transistor, which consists of a quantum dot connected to spin-polarized leads.

(*Physics News Update* 6/26/02) <http://www.aip.org/enews/physnews/2002/split/595-2.html> [NGN 6/27/02].

Crystal-Ball 3D Display

It looks like the Wicked Witch's crystal ball. Actuality Systems Inc.'s unusual globe-like display renders images that are viewable from any angle, and the company is now trying to conjure interest for its use in medical and molecular modeling applications. It also thinks it can reduce the display's \$40,000 cost enough for use in gaming systems. The U.S. Army has also expressed an interest.

(*EETimes* 6/26/02) <http://www.eetimes.com/sys/news/OEG20020626S0037> [NGN 6/27/02].

Entropy Decrease Demo'ed

One of the most important principles of physics—that disorder, or entropy, always increases—is actually untrue at the quantum level, where randomness can lead to a temporary decrease in entropy, that is to say, an increase in order. So far as we know, this change of direction is only temporary and eventually reverses, yet it is interesting and has implications for nanotechnology—the design and construction of molecular machines. They may not work as expected. The entropy increase has now been demonstrated in the laboratory.

(BBC 7/18/02) http://news.bbc.co.uk/hi/english/sci/tech/newsid_2135000/2135779.stm [MP, NGN 7/24/02].

Quantum Dot Charge Detector

A team of German researchers has built a highly sensitive charge detector from the combination of a quantum dot with a nanomechanical device. Robert Blick, group leader and assistant professor at the Ludwig-Maximilians University, Munich, said: "This system allows for ultra-sensitive displacement detection, which is quite important for any scanning probe application."

(*EETimes* 7.23.02) <http://www.electronicstimes.com/tech/news/OEG20020723S0001> [NGN 7/24/02].

Single Atom Memory Device

A memory that stores a "bit" by the presence or absence of a single silicon atom has been developed by physicists at the University of Wisconsin-Madison and the University of Basel in Switzerland. Franz Himpfel's team created the device—made from silicon and gold—which has a storage density of 250 terabits per square inch (R Bennowitz et al *Nanotechnology* 13 499).

(*PhysicsWeb* 7/12/02) <http://physicsweb.org/article/news/6/7/9> [NGN 7/24/02].

Swiss Nano Laboratory

A new laboratory equipped with \$7 million worth of equipment and \$13 million worth of clean room infrastructure opened this month at the Swiss Federal Institute of Technology in Zurich. The nano- and microtechnology facility, called FIRST (an acronym for Frontiers in Research, Space, and Time), is staffed by a team of researchers who are required to balance basic research and joint R&D projects with high tech companies.

(*Small Times* 7/23/02) http://www.smalltimes.com/document_display.cfm?document_id=4217 [NGN 7/24/02].

Vast Improvement Seen in Hard Drives

Nanocontacts could make hard drives go "ballistic." By applying atomic-dimension "nanocontacts" to magnetic media, an experiment at the State University of New York at Buffalo has revealed the potential of an effect known as "ballistic magnetoresistance." The tiny metal contacts showed a 3,000 percent change in magnetoresistance at low switching fields of a few hundred oersted.

(*EETimes* 7/12/02) <http://www.eet.com/at/news/OEG20020709S0041> [NGN 7/24/02].

Nanoparticles Help Dialysis Patients

Altair Nanotechnologies (Nasdaq: ALTI) today announced that it has utilized its patented nanoparticle process to develop a new pharmaceutical/new chemical entity (“NCE”) for the treatment of elevated phosphate levels in kidney dialysis patients. The market for pharmaceuticals used for binding phosphate in kidney dialysis patients is estimated to be approximately \$500 million annually. Making use of the same basic patented process, Altair Nanotechnologies also announced the creation of a new drug dosage form for an existing pharmaceutical.

(PRNewswire 7/16/02) <http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/07-16-2002/0001764637&EDATE> [NGN 7/24/02].

Nanoscale Mapping of Crystal Vibrations

Max Planck scientists use a new type of microscope to make crystal vibrations in the nanometre range visible. Scientists at the Max Planck Institute for Biochemistry in Martinsried near Munich, Germany, have used their infrared near-field microscope to study crystal lattice vibrations (*Nature* 418, 159, 11th July 2002). They used infrared laser beam illumination of a nano-sized antenna to obtain resonance with the vibrations, the so-called phonon resonance. The new technique makes it possible to find out a crystal’s chemical identity, and even its structural quality, both with nanometric resolution.

(Max Planck Society 7/19/02) <http://www.mpg.de/news02/news0216.htm> [NGN 7/24/02].

Interview with Max More

Max More was born and raised in Britain, but moved to the United States in 1987. He is the founder of the Extropy Institute, which studies, ponders, and discusses issues ranging from life extension and cloning to genetic engineering and cryonics. More information is available at www.maxmore.com.

(*Nanomagazine* 7/13/02) http://www.nanomagazine.com/2002_07_13 [NGN 7/24/02].

Laser Aids Nanotech Measurement

Researchers at a joint government-academic institute, reporting in the current issue of *Science*, have created laser light in the previously unattainable extreme ultraviolet spectrum, allowing detailed optical observations of processes at the molecular and atomic scale. The team of scientists at JILA, a partnership between the University of Colorado at Boulder and the National Institute of Standards and Technology, worked around obstacles to generating coherent EUV light, which is difficult to control because of its very short wavelength.

(United Press International 7/19/02) <http://www.upi.com/view.cfm?StoryID=20020719-033020-3757r> [NGN 7/24/02].

Robot Streamlines Protein Analysis

To learn more about life, Berkeley Lab researchers rely on robots. They’ve automated a traditionally slow process in which tiny protein crystals are mounted and centered in an X-ray beam

and analyzed for their molecular structure. The robot, which is the first such device available to general users at a synchrotron, both mounts protein crystals in a beamline and uses the resulting data to decipher the protein’s atomic makeup.

(*Berkeley Lab Science Beat* 7/16/02) <http://www.lbl.gov/Science-Articles/Archive/ALS-Beamline-Earnest.html> [NGN 7/24/02].

Nanowires Self-Assemble

Researchers from Oklahoma State University in the United States and the Hahn-Meiter-Institut in Germany have developed a method to spontaneously self-assemble luminescent crystalline CdTe nanowires from individual nanoparticles. Growing the nanowires is a seven-day-long process. They form not through point-to-point-initiated vectorial growth but by the recrystallisation of multiple nanoparticles in a linear aggregate that fuses gradually into one crystal. Full details of the growth process can be found in *Science*.

(*EETimes* 7/26/02) <http://www.eet.com/at/news/OEG20020726S0001> [NGN 8/4/02].

X-rays Reveal Nanoscale Secrets

Scientists from the U.S. Department of Energy’s Brookhaven National Laboratory and Michigan State University have developed an X-ray diffraction technique that can analyze nanocrystals. They used the method to examine a silicon-oxide zeolite that had caesium ions trapped inside its nano-sized pores. (Nanotechweb.org 7/31/02) <http://nanotechweb.org/articles/news/1/7/25/1> [NGN 8/4/02].

Fluorescing Nanotubes Promise Better MRI

Add fluorescence to the growing list of unique physical properties associated with carbon nanotubes—the ultrasmall, ultrastrong wonderkind of the fullerene family of carbon molecules. In research detailed in the current issue of *Science* magazine, a team of Rice University chemists led by fullerene discoverer and Nobel laureate Richard Smalley describes the first observations of fluorescence in carbon nanotubes. Fluorescence occurs when a substance absorbs one wavelength of light and emits a different wavelength in response. The Rice experiments, conducted by Smalley’s group and the photophysics research team of chemist R. Bruce Weisman, found that nanotubes absorbed and gave off light in the near-infrared spectrum, which could prove useful in biomedical and nanoelectronics applications, including MRI.

(*Small Times* 8/1/02) http://www.smalltimes.com/document_display.cfm?document_id=4321 [NGN 8/4/02].

New Lucent Nanotech Lab

Nanotech backers see a trillion-dollar industry. Government, industry, and academic leaders announced Wednesday that a consortium of private and state interests have come together to form New Jersey Nanotechnology Laboratory, a facility based in Lucent Technologies’ Bell Labs that supporters say will make the state a center in a growing technology worth trillions.

(*North Jersey News* 8/1/02) http://www.bergen.com/page.php?level_3_id=7&page=4483929 [NGN 8/4/02].

Marriage of Nanotech and Biotech

Harvard chemistry professor George Whitesides's latest quest is getting tiny nonliving structures to assemble themselves. ...Much of his work remains in areas that may have implications for biotech: Self-assembling molecules used for making nanomachines, polyvalent drugs that attack a disease from multiple directions, and new analytical tools for drug discovery. He also helped invent a molecule that helps treat anthrax by interfering with the bacteria's toxic machinery....Whitesides's goal is to find a way for nonliving things to spontaneously assemble themselves just as living things do. This would take care of many of the most minute and difficult steps involved in nanofabrication. Already, he's trying to get nonliving devices to self-assemble—and he has started work on advanced nanosize structures that would combine self-replicating machines and the natural self-assembly that occurs in living cells....

(*Business Week* online 7/30/02) http://www.businessweek.com/technology/content/jul2002/tc20020730_2633.htm [NGN 8/4/02].

Functional Devices within Nanowires

While nanowires have been around for many years, scientists had no way of mixing different materials together within one wire. Until now. Setting the stage for integrating devices right into the wires themselves—a development expected to further shrink electronic circuits—three teams of scientists managed to grow single nanowires made from layers of different semiconductors earlier this year. The Swedish team was the first to report the ability to construct functional electronic devices using the technology, within wires just 20 billionths of a meter wide, this week at the 26th International Conference on the Physics of Semiconductors in Edinburgh, Scotland.

(*Wired* 8/2/02) <http://www.wired.com/news/print/0,1294,54093,00.html> [NGN 8/4/02].

Close-Up of Atomic Cave-Dwellers

Researchers have captured the most detailed pictures yet of particles crowded into an industrially useful nanoscale sponge. They extended an old method for analyzing X-ray diffraction data to a zeolite—a porous crystalline substance—filled with metal ions. The result, appearing in the August 12 print issue of *PRL*, confirms that this material is the first room-temperature stable electride, a class of compounds with curious electrical, magnetic, and optical properties that may eventually have applications as nanoscale devices.

(*Physical Review Letters* 7/29/02) <http://focus.aps.org/v10/st4.html> [NGN 8/4/02].

Seeking Huge Benefits from Small Devices

Physicists and biologists at Florida State University are joining forces in a unique partnership with potential implications for advancing medical science and combating bioterrorism with tiny devices. Scientists from FSU's biology department have teamed up with the physics department and the Center for Materials

Research and Technology (MARTECH) to conduct groundbreaking research incorporating biological matter into nanoscale machines. "There has been a lot of speculation about how nanoscale devices in general will improve our lives," said biology Professor Bryant Chase, coordinator for one of the two research projects the scientists will undertake. "If even only 1 percent of the speculation turns out to be correct, our lives will be greatly improved."

(*News Wise* 7/31/02) <http://www.newswise.com/articles/2002/7/DEVICES.FSU.html> [NGN 8/4/02].

Molecular Shapeshifter

In the race to build ever-smaller devices, a new entry appears to have burst into the lead. Researchers in Germany have turned a single molecule into a sort of motor. Azobenzene, a polymer molecule, has a unique characteristic: It changes from one shape to another when exposed to light of different wavelengths. Scientists led by Hermann Gaub, a professor of physics at the University of Munich, have used this quality to build a tiny gadget. (*Popular Science* Aug 02) <http://www.popsci.com/popsci/science/article/0,12543,321209,00.html> [NGN 8/4/02].

"Converging Technologies" Report

A report by the National Science Foundation and the Department of Commerce in the U.S. says the right investment in IT and biotech could have startling results. People linking their brains together to form a global collective intelligence. Humans living well beyond 100 years. Computers uploading aspects of our personalities to a network. These could all happen this century with the proper investments in technology, according to a report from the National Science Foundation and the Department of Commerce. Titled "Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology, Information Technology, and Cognitive Science," the 405-page report calls for more research into the intersection of these fields. (ZDNet 8/6/02) <http://news.zdnet.co.uk/story/0,,t269-s2120374,00.html> [NGN 8/14/02].

Atomic-Resolution Electron Microscope

IBM and Nion Company researchers have created the highest resolution electron microscope. The two companies have developed innovative technology to peer deep inside materials and view atoms interacting in different environments at a resolution never before possible. The new technique significantly extends the capabilities of the electron microscope—a scientific instrument that uses magnetic lenses to focus electrons into very small beams to look at small, atomic-scale details in thin slices of materials.

(IBM.com 8/02) <http://www.ibm.com/news/us/2002/08/08.html> [NGN 8/14/02].

Nanotube Bridges and Self-Assembly

Future nanoscale devices will likely incorporate structural features that are either partially or completely self-assembled. One

of the most fundamental structures necessary for electronic and other devices will be a “bridge” that can link structures. Organic molecules with hydrophilic and hydrophobic portions (amphiphiles) are known to self-assemble into sphere or tube-like structures depending on experimental conditions of solvent, pH, and temperature. Usually, either spheres or tubes form, but not both.

(Chemistry.org 8/14/02) http://chemistry.org/portal/Chemistry?PID=feature_pro.html&id=156b1bc8a57811d6f1d04fd8fe800100 [NGN 8/14/02].

Nanoparticles Nab Solar Energy

An enormous source of clean energy is available to us. We see it almost every day. It’s just a matter of harnessing it. The problem with solar energy is that it has not been inexpensive enough in the past. David Kelley, professor of chemistry at Kansas State University, developed a new type of nanoparticle—a tiny chemical compound far too small to be seen with the naked eye—that may reap big dividends in solar power....Kelley is developing nanoparticles that are just the right size for solar cells—they can absorb all visible light but nothing from the invisible light at the red end of the spectrum, which would reduce voltage.

(*Science Daily* 8/9/02) <http://www.sciencedaily.com/releases/2002/08/020809071535.htm> [NGN 8/14/02].

Upholding Moore’s Law

At three VLSI symposia in Honolulu, Hawaii, researchers debated the best way to update chip materials for the nanoelectronics age. The guardians of Moore’s Law, which states that the number of transistors on an IC doubles every 18 months, met in Honolulu, June 9-15, for three consecutive symposia, to ensure that the law remains in force. The burning question before the Nanoelectronics Workshop, the VLSI Technology Symposium, and the VLSI Circuits Symposium was this: If an IC’s smallest features are to shrink to 90 nm and below, what properties will be needed in its transistors and the wires interconnecting them?

(*IEEE* 8/1/02) <http://www.spectrum.ieee.org/WEBONLY/resource/aug02/vlsi.html> [NGN 8/14/02].

Jumping Genes Can Knock Out DNA

Results of a new University of Michigan study suggest that junk DNA—dismissed by many scientists as mere strings of meaningless genetic code—could have a darker side. In a paper published in the August 9 issue of *Cell*, scientists from the U-M Medical School report that, in cultured human cancer cells, segments of junk DNA called LINE-1 elements can delete DNA when they jump to a new location—possibly knocking out genes or creating devastating mutations in the process.

(University of Michigan Health System 8/8/02) <http://www.med.umich.edu/opm/newspage/2002/junkdel.htm> [NGN 8/14/02].

Nanotech Encyclopedia

From recent e-mail: “Dear Sir/Madam: American Scientific Publishers is bringing the *Encyclopedia of Nanoscience and*

Nanotechnology in 10 volumes in March 2003. This is the World’s first encyclopedia ever published in the field of Nanotechnology.” The ten-volume set (6,000 pages) is forwarded by Richard E. Smalley and will be available in print or online. The editor of the new encyclopedia, Hari Singh Nalwa, is also the chief editor of the *Journal of Nanoscience and Nanotechnology* published by American Scientific Publishers. In 1999 he also was the editor for the *Handbook of Nanostructured Materials and Nanotechnology* which was published in 2000. It will be interesting to see how this series turns out. There are quite a few promises in a tremendous amount of nanoscale areas and a rather large advisory board.

(<http://www.aspbs.com/enn>) [NGN 8/14/02].

Nano Leadership Bid

Chicago is looking to seize leadership in the emerging field of nanotechnology by providing tax subsidies to foster a high-tech corridor on the Near West Side. The first beneficiary will be a start-up called NanoInk Inc., which is seeking \$1 million in tax-increment financing to move into a three-story brick building at 1335 W. Randolph Street. The 44,000-square-foot building is on a former industrial strip now dotted with restaurants, near where MarchFirst Inc. had planned a world headquarters campus. City officials were hoping MarchFirst’s growth would contribute to the area’s revitalization, but the Internet consultancy declared bankruptcy last year, and its real estate is being sold.

(*Small Times* 8/12/02) http://www.smalltimes.com/document_display.cfm?document_id=4413 [NGN 8/14/02].

Giant Ions Invade

If physics had a sideshow, the latest addition would surely be this: bacterium-sized ions. According to new theoretical results, normal ions dropped into a Bose-Einstein condensate (BEC)—an ultracold gas in its quantum mechanical ground state—could seed the formation of micron-wide charged shells of atoms, or “molecular ions.” These objects, described in the August 26 print issue of *PRL*, could serve as moveable microtraps for atoms or aid in testing condensed matter theories.

(*Physical Review Letters* 8/13/02) <http://focus.aps.org/v10/st8.html> [NGN 8/14/02].

Intellectual Property Rights in Nanotechnology

Intellectual property rights are essential in today’s technology-driven age. Building a strategic IP portfolio is economically important from both offensive and defensive standpoints. Applicable areas in nanotechnology to which intellectual property rights can apply are viewed, along with some challenging issues surrounding the acquisition of IP rights in nanotechnology.

(*Nanomagazine.com* 8/02) <http://www.nanomagazine.com/articles/ipnanotech> [NGN 8/14/02].

Center for Integrated Nanotechnologies

Sandia and Los Alamos national laboratories will jointly receive \$75.8 million for the design and construction of buildings to house the practical yet visionary Center for Integrated Nanotechnologies

(CINT). The Office of Science of the U.S. Department of Energy approved funding in July for two new buildings: a joint core facility in Albuquerque and a smaller gateway building in Los Alamos.

(Sandia 8/8/02) <http://www.sandia.gov/news-center/news-releases/2002/mat-chem/nanotechcenter.html> [NGN 8/14/02].

Alfalfa Harvests Nanoparticles

Scientists use alfalfa plants to harvest nanoparticles of gold. Ordinary alfalfa plants are being used as miniature gold factories that one day could provide the nanotechnology industry with a continuous harvest of gold nanoparticles. An international research team from the University of Texas-El Paso (UTEP) and Mexico advanced the work at the Stanford Synchrotron Radiation Laboratory (SSRL)—part of the Stanford Linear Accelerator Center (SLAC) in Menlo Park, California. The researchers are using, as tiny factories, the alfalfa's natural, physiological need to extract metals from the medium in which they are growing. Of most value here is that the alfalfa extracts gold from the medium and stores it in the form of nanoparticles—specks of gold less than a billionth of a meter across.

(EurekAlert 8/14/02) http://www.eurekalert.org/pub_releases/2002-08/su-sua081402.php [NGN 8/14/02].

Nanotech by the Numbers

It's virtual reality, writ small: atom-by-atom simulations of new materials could usher in the nanotech future sooner than anybody imagined. In his cramped cubicle at Nanomix, a nanotechnology company in Emeryville, California, just across the bay from San Francisco, theoretical physicist Seung-Hoon Jhi peers at a computer model of a hydrogen fuel tank, carefully tracking the movement of individual molecules. As he raises the temperature of a simulated sheet of boron and nitrogen atoms from a frigid 50 Kelvin to a slightly less chilly 80 Kelvin, he watches the reaction of a handful of hydrogen molecules dotting its surface. The boron nitride sheet undulates, yet the hydrogen molecules hold fast. It's an encouraging sign in a virtual experiment that may have just saved weeks or months of painstaking experimental testing in Nanomix's effort to develop more efficient hydrogen storage materials for fuel cell cars.

(*Technology Review* 9/02) <http://www.technologyreview.com/articles/fairley0902.asp> [NGN 8/21/02].

Nanocrystals from Common Scrap

Researchers at Purdue University have made a surprising discovery that could open up numerous applications for metal "nanocrystals," or tiny crystals that are often harder, stronger and more wear resistant than the same materials in bulk form. The research engineers have discovered that the coveted nanocrystals are contained in common scrap, the chips that are normally collected and melted down for reuse. "Imagine, you have all of these bins full of chips, and they get melted down as scrap," said Srinivasan Chandrasekar, a professor of industrial engineering. "But, in some sense, the scrap could be more valuable pound-for-pound than the material out of which the part is made."

(Purdue University 8/16/02) <http://news.uns.purdue.edu/UNS/html4ever/020816.Chandrasekar.nano.html> [NGN 8/21/02].

Emulating Nature for Nano Self-Assembly

A newly developed self-assembly technique emulates nature to build designer polymers from modular parts. Future designer polymers may be assembled like children's Lego toys using modular polymer scaffolds programmed to attract building blocks of small molecules. Weak and easily reversed chemical interactions would self-assemble those molecules to form complex structures with predictable physical and chemical properties. In the natural world, self-assembly techniques produce thousands of varied life forms—bacteria to human beings—based on a relatively small set of amino acids and nucleotides combined in different ways. By emulating this natural system, polymer chemists at the Georgia Institute of Technology hope to simplify the synthesis of new materials for light-emitting diodes, optical storage materials, biosensors, drug-delivery materials and other applications.

(EurekAlert 8/18/02) http://www.eurekalert.org/pub_releases/2002-08/giot-ste081802.php [NGN 8/21/02].

Buckytubes for Nanoelectronics

Duke University chemists are producing increased quantities of single walled carbon nanotubes, sometimes called "buckytubes," in forms suitable for use in futuristic molecular scale electronic devices. A team led by Duke assistant professor of chemistry Jie Liu, <http://www.chem.duke.edu/~jliu/labgroup/>, is producing nanotubes in larger numbers by altering their recipes for making the molecules. They also are growing the molecules on silicon surfaces to guarantee purity and favorable electronic properties. (Duke News Service 8/21/02) <http://www.dukenews.duke.edu/nanotubes.html> [NGN 8/21/02].

Protein to Improve Hard Disk Capacity

A Bristol, UK-based company, Nanomagnetics, has developed a novel process to manufacture tiny, uniform, magnetic grains to be used in data storage for hard drives. The process uses ferritin, a protein that stores iron in plants and humans. The ferritin molecule, shaped like a very small soccer ball, has an inner cavity in which the magnetic grains are grown. The grains are limited to a size of 8 nanometers, which, it is hoped, will lead to data densities 100 times current levels.

(Boston/Internetnews.com 8/21/02) <http://boston.internet.com/news/article.php/1449991>; For NanoMagnetics contact information see http://www.nanomagnetics.com/navi/frn_contactus.html [MP, NGN 8/21/02].

Nanotech Gene Mapping

Genicon Sciences and its venture capital investors are hoping that big things really do come in little packages. The privately held San Diego biotechnology company in July launched its first product—a way to analyze genes that Genicon boasts is the first true nanotechnology to make it to the life sciences market. Nanotechnology, the science of engineering at the molecular level, comes from the word nanometer—which is a billionth of a

meter, the length of about five atoms.
(SignOnSanDiego.com 8/16/02) http://www.signonsandiego.com/news/business/biotech/20020816-9999_1b16nano.html [NGN 8/21/02].

Mammoth to Be Cloned?

In an eerie recreation of Steven Spielberg's blockbuster *Jurassic Park*, scientists are planning to clone an extinct animal to be the central attraction of a wildlife park. The *Times* of London reports that Japanese scientists are planning to use tissue from the legs and testicles of a dead mammoth to clone the extinct creature and display it at an Ice Age wildlife park in Siberia.
(CNN 8/21/02) <http://www.cnn.com/2002/TECH/08/21/clone.mammoth/index.html> [NGN 8/21/02].

Nanolithography Company

NanoInk writes its own ticket using quills on the nanoscale. NanoInk Inc., a mere seven months old, has released its first product: a software-and-supplies package that turns any atomic force microscope into a Dip-Pen Nanolithography (DPN) machine. DPN-System-1 retails for \$30,000 to \$40,000 and is targeted to research labs. Now comes the hard part—making a bunch of AFM pen tips work in an array large enough for manufacturing. The company promises an array product by early 2003.
(*SmallTimes* 8/19/02) http://www.smalltimes.com/document_display.cfm?document_id=4448 [NGN 8/21/02].

Oak Ridge High-Speed Connection

Oak Ridge National Laboratory's new computer link to Atlanta is 200,000 times faster than the fastest dial-up connections typical of home computers and is expected to spur significant advances in science and economic development in the region and beyond.
(Oak Ridge National Laboratory 8/14/02) http://www.ornl.gov/Press_Releases/current/mr20020814-00.html [NGN 8/21/02].

Nanotubes Beget Nanotube Networks

Researchers at Rensselaer Polytechnic Institute, New York, have used carbon nanotubes as a template for growing networks of aligned carbon nanotubes. They reported the two-step chemical-vapour deposition process in *Applied Physics Letters*. "We wanted to explore the possibility of using nanotubes themselves as pattern masks for growing organized carbon nanotube array patterns of different length scales," Anyuan Cao of Rensselaer Polytechnic Institute told nanotechweb.org.
(Nanotechweb 8/20/02) <http://nanotechweb.org/articles/news/1/8/16/1> [NGN 8/21/02].

Live Births from Transplanted Uterus

The world's first live births from a transplanted uterus have been achieved, say Swedish researchers. The procedure, conducted in mice, would be easier to repeat in humans, they predict. A mouse uterus is V-shaped. The team led by Mats Brännström at Göteborg University, Sweden, grafted one arm of the V from a donor mouse into another's abdomen, alongside its existing uterus. In a woman,

the procedure would involve removing the existing organ and positioning the whole donor uterus.
(*NewScientist* 8/21/02) <http://www.newscientist.com/news/news.jsp?id=ns99992694> [NGN 8/21/02].

Wires Important for Nano ICs

Implementing nanometer-scale integrated circuits (ICs) begins and ends with wires. Wires are so dominant that little is known about a design's performance or manufacturability without them. In fact, nanometer design strategies that are not clearly focused on rapid wire creation, optimization, and analysis are destined to fail. "Down to the wire—requirements for nanometer design implementation," by Ping Chao and Lavi Lev describes the requirements for an effective, reliable IC implementation platform for the 90 nm process node and beyond. It begins with a description of the central role wires play in nanometer design and why traditional linear design flows are insufficient. It then describes a new continuous convergence methodology, which has proven highly valuable at 0.13 micron and will be absolutely necessary at 90 nm.
(EEDesign.com 8/15/02) <http://www.eedesign.com/features/exclusive/OEG20020815S0053> [MP, NGN 8/21/02].

Nanotubes Speed Up

Transistors fabricated from carbon nanotubes now have electrical characteristics that can rival silicon devices. The idea of using molecules as electronic components has been around since at least 1974, when Ari Aviram of IBM in New York and Mark Ratner, then at New York University, showed theoretically that a molecule placed between two metal electrodes can act as a rectifier. However, it took more than 20 years before an individual molecule was successfully connected to two nanofabricated electrodes in an experiment. The difficulties lay in the manipulation of single molecules and in the ability to build electrodes separated by only a few nanometers.
(Nanotechweb.org 8/16/02) <http://nanotechweb.org/articles/feature/1/8/3/1> [NGN 8/21/02].

Nanoantennas

Researchers have shown how tiny wires and metallic spheres might be arranged in various shapes to form "nanoantennas" that dramatically increase the precision of medical diagnostic imaging and devices that detect chemical and biological warfare agents. Engineers from Purdue University have demonstrated through mathematical simulations that nanometer-scale antennas with certain geometric shapes should make possible new sensors able to detect a single molecule of a chemical or biological agent. Such an innovation could result in detectors that are, in some cases, millions of times more sensitive than current technology.
(Purdue News 8/21/02) <http://news.uns.purdue.edu/html4ever/020821.Shalaev.nanoantenna.html> [NGN 8/21/02].

Charting the Future of Nanogeoscience

How does a tiny sulfide particle travel from a Chinese factory to

California? And how does it react when it gets there? Scientists don't know precisely, which is one of many reasons Berkeley Lab researchers are helping to shape the future of a new field called nanogeoscience. As the name implies, it's the study of geological processes involving particles no larger than 100 nanometers, meaning in some cases as small as a few atoms across. Such particles play critical roles in carbon sequestration, air pollution, and even the removal of toxins from soil.

(*Berkeley Lab Science Beat* 8/26/02) <http://enews.lbl.gov/Science-Articles/Archive/ESD-nanogeoscience.html> [NGN 8/30/02].

Unnatural Optics Creates Precise Photonic Lens

Optical experiments using arrays of nanowires are demonstrating that the concept of a negative refractive index could be realized in practical systems. The work, done at Purdue University, attempts to reproduce results similar to those shown last year at the University of California at San Diego using microwave radiation. A negative refractive index, which is not found in nature, would allow scientists to construct new types of microscopes with unprecedented resolution and could allow the creation of novel photonic devices.

(*EETimes* 8/27/02) <http://www.eetimes.com/at/news/OEG20020826S0041> [NGN 8/30/02].

Gecko Feet Suggest Dry Adhesive

Scientists get to grips with what makes geckos stick. Geckos, those tiny lizards Britons most often see scurrying up walls in rural Provence, have taught engineers a thing or two about getting a grip. The answer lies in an evolutionary masterpiece of nanotechnology. Dr. Autumn and colleagues from California report in the *Proceedings of the National Academy of Sciences* that gecko feet are covered in hairs called setae. Each hair is 100 micrometers long. It has 1,000 pads at the tip, and these pads, or spatulae, are 200 nanometers wide. The discovery could lead to a dry, self-cleaning adhesive that works underwater or in the vacuum of space. The team is working with a robotics firm to design tiny automata that could climb even when upside down. (Guardian Unlimited 8/27/02) http://www.guardian.co.uk/uk_news/story/0,3604,781031,00.html [NGN 8/30/02].

Exciting New State for Excitons

Researchers with the Lawrence Berkeley National Laboratory (Berkeley Lab), in collaboration with a scientist at the University of California's Santa Barbara campus, have reported the observation of excitons (bound pairs of electrons and "holes") that display a macroscopically ordered electronic state that indicates they have formed a new exciton condensate. The observation holds potential for ultrafast digital logic elements and quantum computing devices. The observations were made by shining laser light on specially designed nano-sized structures called quantum wells, which were grown at the interface between two semiconductors.

(*Science Daily* 8/27/02) <http://www.sciencedaily.com/releases/2002/08/020826071235.htm> [NGN 8/30/02].

Faster, Cheaper Genome Sequencing

A small British company said it is close to unveiling a prototype of a novel single-molecule array that can resequence an individual human genome with single-base resolution at a fraction of the time and cost of currently used methods. The technology being developed by the company, Solexa, is an unaddressed and monodispersed high-density array designed to deliver base-by-base sequencing without the need for DNA amplification, the company said. There are two principal components to the technology, said Nick McCooke, the company's CEO: The actual nanotechnology-based single-molecule array platform, currently in the pre-prototype stage, and a sequencing chemistry, which is expected to appear early next year.

(Genomeweb.com 8/23/02) <http://www.genomeweb.com/articles/view-article.asp?Article=200282393037> [NGN 8/30/02].

Light Powers Nanopump

Hopes are now rising for nanoscale delivery of medicine using a light beam to move liquid through tiny tubes. Medical researchers would like to use nanoscale tubes to push very tiny amounts of drugs dissolved in water to exactly where they are needed in the human body. The roadblock to putting this theory into practical use has been the challenge of building pumps small enough to do the job. In addition to the engineering challenge of building a nanoscale pump, there is the added complication of clogging by any biological molecule that can occur in valves small enough to fit a channel the size of bacteria. The solution—discovered by researchers at Arizona State University—is to create a system that does not rely on mechanical parts. The ASU team of scientists and engineers reports in the American Chemical Society journal *Langmuir* (Thursday, August 29, 2002) on a technique they developed to pull water up a tube tinier than a straw by shining a beam of light on the surface of the tube.

(EurekAlert 8/28/02) http://www.eurekalert.org/pub_releases/2002-08/asu-hfn082802.php [NGN 8/30/02].

Antinotech Environmentalist Article

No small matter! Nanotech particles penetrate living cells and accumulate in animal organs. At a mid-March fact-finding meeting at the U.S. Environmental Protection Agency (EPA), researchers reported that nanoparticles are showing up in the livers of research animals, can seep into living cells, and perhaps piggyback on bacteria to enter the food chain. The commercial use of nanoscale carbon was likened to either "the next best thing to sliced bread or the next asbestos." Despite these revelations, there is no regulatory body (and no plans for one) dedicated to overseeing this potent and powerfully invasive new technology. (etcgroup.org 7/23/02) <http://www.etcgroup.org/article.asp?newsid=356> — The New York Times on 8/19/02 covers the ETCs request for banning, discussing both sides of this issue. See: <http://www.nytimes.com/2002/08/19/technology/19NECO.html> [NGN 8/30/02].

Atom by Golden Atom

Discovery reveals smallest size molecules form functional struc-

tures; nanotechnology research implications may be significant. While it may not make much of an anniversary present, a gold chain built atom by atom by UC Irvine physicist Wilson Ho offers an answer to one of the basic questions of nanotechnology—how small can you go? In the first study of its kind, Ho and his colleagues have discovered the molecular phase when a cluster of atoms develops into a solid structure, a finding that can have a significant impact in the future development of metal structures built at the molecular scale.

(UCI news release 8/28/02) <http://today.uci.edu/releases/126tv02.html> [NGN 8/30/02].

Catalysts as Nanoassemblers

For 15 years, ever since K. Eric Drexler's *Engines of Creation* launched the nanocraze, the field has been plagued by sci-fi notions of tiny robotic "molecular assemblers" running around shoving atoms together. But as buckyball pioneer Richard Smalley remarks, molecular assemblers have long existed: "We call them catalysts." Catalysts are "helper" substances that promote chemical reactions without themselves being consumed. Nature's catalysts—enzymes—assemble only specific end products. Industrial catalysts are rarely so precise. Gabor Somorjai of Berkeley Lab's Materials Sciences Division, a professor of chemistry at UC Berkeley, notes that "you can increase the octane rating of gasoline remarkably" by catalyzing its hydrocarbon precursor over platinum, "but there are at least seven or eight directions the reaction can go."

(ICA Syndicate 8/02) http://www.icasyndicate.com/html_reports/ica_nano_tech_0802.html [NGN 8/30/02].

Overpromoting AI?

Pundits can't stop hyping the business opportunities of artificial intelligence. In 1983, artificial intelligence appeared on the mainstream business radar, when a book entitled *The Fifth Generation* (Addison Wesley) slammed onto the best-seller lists. In it, authors Edward Feigenbaum and Pamela McCorduck described how the Japanese government was investing billions of dollars to create machines that could think. Japan's investment turned out to be a monumental failure that consumed several billion dollars and channeled much of the country's high-tech community into a technological dead end. Now, if a number of AI pundits have their way, the United States could make a similar mistake. A spate of books that tout astounding breakthroughs in AI are about to hit the shelves. There is some Ray Kurzweil bashing in this article.

(Red Herring 8/23/02) <http://www.redherring.com/insider/2002/08/ai082302.html> [MP, NGN 8/30/02].

"Fingerprinting" for Biological Agents

Northwestern University scientists have developed a new method for detecting infectious diseases, including those associated with many bioterrorism and warfare threats such as anthrax, smallpox, and HIV. The technique could enable researchers to create thousands of DNA detection probes made of gold nanoparticles with individual molecules attached. Much like human finger-

prints, these molecules act as unique signals for the presence of biological agents. The method can easily distinguish smallpox's distinct "fingerprint" from that of HIV.

(EurekaAlert 8/29/02) http://www.eurekaalert.org/pub_releases/2002-08/nu-rd082802.php [NGN 8/30/02].

China Nanotechnology Center

Veeco Instruments Inc. (NASDAQ: VECO) announced Sept. 3 that it has established a China Nanotechnology Center facility (CNC) in Beijing, China. The facility will be staffed with local scientists and engineers and equipped with Veeco's latest Atomic Force Microscope (AFM), Scanning Tunneling Microscope (STM) products, and other advanced nanotechnology application modules. The CNC will be jointly operated with the Institute of Chemistry of the Chinese Academy of Sciences (CAS). Day-to-day operations will be managed by Oliver Yeh, Veeco's newly appointed General Manager for China. The CAS is a national institution for scientific research and promotes original scientific innovation and integration of key technologies. Institutes organized under the CAS auspices perform first-class research and open up new directions of research, in particular in the area of nanometer sciences.

(StockHouse Australia news 9/3/02) <http://www.stockhouse.com/news/news.asp?tick=VECO&newsid=1276899> [NGN 9/9/02].

Nanoparticles Eyed for Toxin Detection

The latest silicon-based technology developed to thwart terrorists is "smart dust" produced at the University of California, San Diego. A research group has developed a method for fabricating porous-silicon nanoparticles that have a selective response to light. The process enables a given chemical, a toxin, for instance, to change the reflectivity of a cloud of particles, creating a unique signature that can be detected from a distance.

(EETimes 9/9/02) <http://www.eetimes.com/at/news/OEG20020909S0082> [NGN 9/9/02].

Nanotechnology May Aid Environment

For scientists who study it, nanotechnology is considered a clean technology—perhaps even the key to solving some current environmental ills. And the field is advancing rapidly. The National Science Foundation has been cutting its timetable for the release of nanotech-fueled products from five or ten years to two or three years, said Mihail Roco, NSF's senior adviser on nanotechnology. First products likely to emerge are in medicine, Roco said. Nanotechnology will so thoroughly impact the way science addresses medicine, food, electronics, and the environment, that within a decade or so, Roco envisions a \$1 trillion yearly market in products that carry nano-components, including all computer chips, half of pharmaceuticals and half of chemical catalysts.

(Siliconvalley.com via Ap Wire 9/8/02) <http://www.siliconvalley.com/mld/siliconvalley/news/4031259.htm> [NGN 9/9/02].

Enhanced Prison Security

A sophisticated radio monitoring system is now being installed

at a handful of U.S. prisons. If widely adopted, it could one day change the way correctional facilities are run. "It completely revolutionizes a prison because you know where everyone is—not approximately but exactly where they are," said Larry Cothran, a technology consultant to the National Institute of Justice. Using radio transmitters monitored by a network of receivers, the system tracks prisoners and corrections officers to within 20 feet. Inmates wear tamper- and water-resistant bracelets while officers wear pager-like devices. It's a high-tech version of the head count, except these head counts are conducted every two seconds versus the old-fashioned five to eight times a day. (AP 9/9/02; Pressdemocrat.com) http://www.pressdemocrat.com/business/news/09prison_d1.html [MP].

Growing New Body Parts

The Vacanti brothers are to the brand new field of tissue engineering what the Wright Brothers were to aviation. Jay Vacanti is trying to build whole human organs. Chuck Vacanti is tackling spinal cord repair. Marty Vacanti has discovered a remarkable new cell. Frank Vacanti is trying to make mammals regenerate like salamanders. The Vacantis work in one another's labs, collaborating and sometimes competing. (NY Times 9/10/02) <http://www.nytimes.com/2002/09/09/science/sciencespecial/0910scitv.html> [MP].

Crashworthiness

Each air tragedy presents painful lessons to be learned. How do we determine what went wrong? And can we prevent it from happening again? In the Arizona desert, students—the air safety investigators of the future—are learning a critical skill. How to analyze a plane crash. This is Embry-Riddle, the world's premiere aeronautics university and home of a unique facility: a crash lab. Eliminating all accidents will probably never be possible. To help deal with the inevitable, scientists have developed a technology called *crashworthiness*. The idea is to reduce the chances of injury or death during an accident by designing aircraft that will absorb the shock of the crash. (NY Times 8/20/02) <http://www.nytimes.com/2002/08/19/science/sciencespecial/0820scitv.html> [MP].

Double-Gate Nanotransistor

Hoping to beat IBM, Intel, TSMC, and others to the punch, Advanced Micro Devices Inc. announced that it has fabricated the world's smallest double-gate transistors—based on a Fin Field Effect Transistor (FinFET) technology. Measuring a mere 10 nm (0.01-micron)—or ten billionths of a meter in length (gate)—AMD's FinFET technology could foster the development of a 1-billion transistor device, such as a microprocessor. (Silicon Strategies 9/10/02) <http://www.siliconstrategies.com/story/OEG20020909S0106> [MP].

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(continued from page 35)

In addition to the critics who coauthor the book, another and different sort of critic, Bill Joy, gets a share of attention. The founder of Sun Microsystems, Joy was at one time a proponent of the very progress he himself helped foster, but became frightened by the possible misuses of nanotechnology and other advancing technologies. He now fears we could make *too much* progress in certain areas and wants research efforts curbed—by government intervention. Genetics, nanotechnology, and robotics must all be muzzled; capitalism and freedom must accept the necessary restrictions. Kurzweil is strongly opposed to this phobic conservatism and notes that no substantial progress can occur without risks. The risks in this case he thinks worth taking; surely the good will prevail and outweigh its opposite. The sort of risk Joy fears is that a small band of terrorists or a lone individual could gain access to weapons of mass destruction that our developing technology would make feasible to acquire or invent—the bad could more than nullify the good. One certainly hopes Kurzweil is right. With so many, including us immortalists, aware of the tremendous potential for benefit and eager to see it realized, it seems likely we'll get a chance to find out.

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The Kurzweil web site, <http://www.kurzweilai.net>, offers a glimpse into a future with unprecedented opportunities for benefit and also dangers that must not be overlooked. Topics to click on include:

- **the singularity**
- **will machines become conscious?**
- **living forever**
- **how to build a brain**
- **virtual realities**
- **point/counterpoint**
- **nanotechnology**
- **visions of the future**
- **dangerous futures**
- **upcoming events**



There you'll also find the book *Are We Spiritual Machines?* online. There are many contributors with many ideas; check it out!

Letters to the Editor

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