

Cryonics

February, 1988 Volume 9(2)



**MEDICINE:
THE NEXT 20 YEARS**

Volume 9(2)

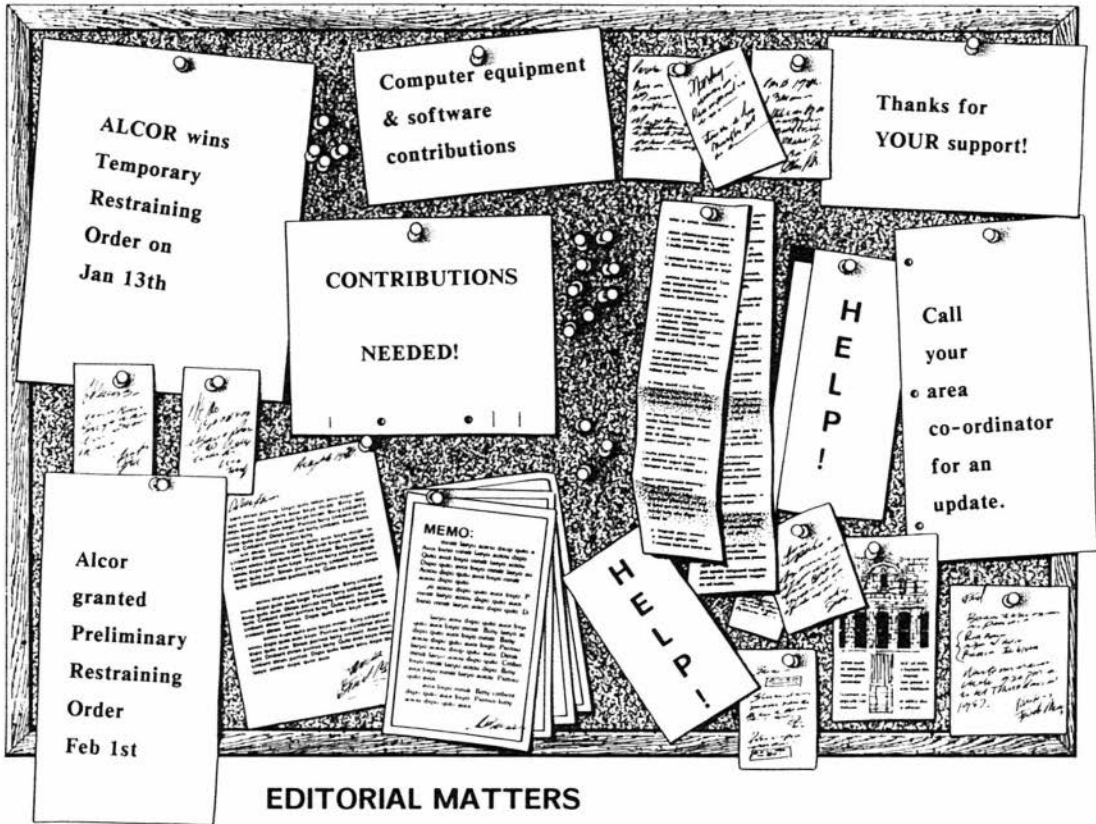
February, 1988

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EDITORIAL MATTERS

The events of the last two months have come in such rapid succession and have had such enormous and dramatic impact on Alcor and the people who make it up that it is simply not possible to give you any definitive picture in the pages of CRYONICS. We will do the best we can, but the sheer volume of what has happened makes the pages of CRYONICS an impractical vehicle to communicate it.

A larger and more serious problem in telling you about what has happened is that in many ways we ourselves do not know. It takes some distance from events to gain perspective on them and sort them out, and it will be some time before this happens for us. We are still shell-shocked and dazed as we walk in from the battlefield. But make no mistake, **we are walking**. We have fought -- and won a substantial victory.

We will chronicle what has happened and what it all MEANS as we are able to do so. Please bear with us.

Keep in mind also that CRYONICS is a poor vehicle for up-to-the-minute news. When events move as fast as they have in recent weeks, only a fax machine or a telephone could keep you posted in a timely fashion. We regret that the January and February issues of CRYONICS are so far behind. We make no promises except that we'll give you one issue per month -- even if we do run behind schedule.

How To Avoid Autopsy -- Con't

The final installment of "How to Avoid Autopsy" is being postponed more or less indefinitely. The last section was the most difficult and complicated of the three-part article and was to deal with specific risk reduction strategies for arteriosclerotic disease (the leading cause of sudden death). The third installment of the article is only partially completed, and the press of other business will no doubt defer completion until sometime during the Summer or Fall (barring further crises!)

* * * * *

A VICTORY ON FEBRUARY 1st

On January 13, 1988, Alcor won an unprecedented temporary restraining order against the Riverside County Coroner, barring him from autopsying Dora Kent or any of the other Alcor patients. On February 1st we returned to Riverside Superior Court asking for a preliminary restraining order (PRO). To the amazement of almost everyone involved (especially the Coroner) we got the PRO! The order effectively bars the Coroner from autopsying any Alcor patients without the Coroner having to return to court and show cause as to why this would be necessary and in the interest of the state and the people of California. This ruling is a first and is a groundbreaking precedent upholding the rights of patients in cryonic suspension.

Alcor presented an extensive set of scientific and forensic declarations to support its pleading for restraint of the Coroner. These declarations upheld the scientific and technical validity of cryonics as a reasonable undertaking and were made by leading experts in a number of disciplines including cryobiology,



Local

The Press-Enterprise

City, council sued over Measure C ...
Judges filing for re-election
Obituaries

SECTION
B

Tuesday, February 2, 1988

Thawing of heads blocked

No proof Dora Kent decapitated alive

By DON BABWIN
The Press-Enterprise

A Riverside County Superior Court judge yesterday barred coroner's investigators from thawing the head of Dora Kent — if and when they find it — and the six heads and one body being stored at a Riverside cryonics laboratory.

Speaking to a crowded courtroom that included Kent's son and coroner's investigators, Judge Victor Miceli said he found no evidence Kent was alive when she was decapitated. And he said thawing the head would cause "irreparable injury."

Coroner's investigators are trying to determine whether Kent was alive when a procedure to remove her head was begun.

Miceli left open the possibility the coroner might still be allowed to examine the head. Investigators, he said after the hearing, would have to show evidence that creates a "reasonable suspicion that she was alive" when decapitated and that an examination of the head could assist in an investigation.

The ruling, said Miceli, can be reversed, but a ruling in favor of the coroner would have been irreversible.

"The head is frozen," he said after the hearing. "It's not going to make any difference (if it is thawed out) today or tomorrow." To let the coroner's office examine the head "is a final decision," he said.

Joyce Manulis Reikes, deputy county counsel, argued that to rule in favor of Saul Kent and the Alcor Life Extension Foundation would inhibit the coroner from conducting investigations. Such a decision, she said, would "set a really dangerous precedent" and would clear the way for a "flood" (See HEADS, Page B-2)



Superior Court Judge Victor Miceli said he found no evidence Dora Kent was alive when her head was removed. He ordered the coroner not to thaw the head.



Deputy county counsel Joyce Manulis Reikes said investigating deaths is the coroner's duty.



Saul Kent, son of Dora Kent, said he was "very happy" with the judge's decision.



Christopher Ashworth of Los Angeles, Saul Kent's attorney, argues a point.

KURT MILLER/The Press-Enterprise

Heads . . .

(From Page B-1)
of litigation" whenever anyone disagrees with the coroner.

"The coroner has the duty to investigate deaths . . ." said Reikes. It is up to the coroner, she said, to "determine how far that investigation must go."

Miceli disagreed. "It is an even more dangerous precedent to not have restrictions on any public officials," he said after the hearing. "He has a duty, yes, but he can't do anything he wants to under the guise he is carrying out his responsibilities."

Miceli emphasized that he did not believe the coroner's office has acted improperly.

During the hearing, Alcor and Saul Kent's attorney, Christopher Ashworth, from Los Angeles, presented statements from various medical experts who sold cryonic suspension — freezing bodies in hopes of reviving them at a later date — may work in the future.

Ashworth also said Dora Kent wanted her head to be frozen and it should not be thawed out. "It is her life in the balance against almost a technical curiosity of whether a homicide had been committed."

Ashworth argued that not only did Kent have the constitutional right to commit suicide, but that people have the right to assist others in suicide attempts.

Both Miceli and Reikes said

an individual has no constitutional right to commit suicide or to assist in a suicide. In fact, said Reikes, there is a section in the state penal code prohibiting assistance in a suicide attempt.

Reikes said there is no evidence that Dora Kent wanted this procedure at all. "In this case we have only self-serving statement of Saul Kent," she said.

After the hearing, Saul Kent said he was "very happy" with the judge's decision. "This is a real test of the American system of justice," he said, "and so far I must say the American justice system is working."

He declined comment on the whereabouts of his mother's head. Alcor officials have said

Kent is in control of Dora Kent's head.

Coroner Raymond Carrillo, who has said his office needed Dora Kent's head to complete its investigation, could not be reached for comment yesterday. Supervising Deputy Coroner Don Cupilo would only say that the investigation into the death of Dora Kent is continuing.

United Way branch tries
lottery to raise donations

Gibbs: Super
repeat unlikely



Price of Inland Empire
resale homes rises 3%



The Sun

SAN BERNARDINO
COUNTY

TUESDAY/25¢
FEBRUARY 2, 1986
METRO EDITION

Cryonics center wins another round in court

By TONY SAAVEDRA
Sun Staff Writer

RIVERSIDE — A court order protecting the still-missing head of Dora Kent from autopsy was extended indefinitely Monday, dealing another blow to the coroner's investigation of a Riverside cryonics center.

Superior Court Judge Victor Miceli ruled that Riverside County Coroner Raymond Carrillo did not provide enough evidence to justify thawing the woman's frozen head — and destroying any chance she might have of someday being resurrected.

The judge later maintained he was not giving credence to or acknowledging the possibility of a cryonic resurrection.

The head of Kent, 83, was surgically removed and frozen at minus 385 degrees Fahrenheit in liquid nitrogen, in hopes science will find a way to revive her. The freezing process is called cryonic suspension.

The unusual surgery by Alcor Life Extension Foundation triggered a coroner's inquiry to determine whether Kent died on Dec. 11 of natural causes or from

See CRYONICS/Back page

Cryonics: Judge extends order against autopsy

Continued from A1
the process of preserving her head.

The latest ruling mirrors the temporary restraining order Miceli issued Jan. 13, protecting Kent's head and barring investigators from defrosting any of the six other heads or the full body entrusted to Alcor. Carrillo said earlier he has no intentions of thawing the other people now in cryonic suspension.

Authorities have been unable to locate Kent's head, which was removed from Alcor's Doherty Street laboratory before a Jan. 7 search by the coroner's office.

With Monday's ruling, Alcor officials said they suspect Dora Kent's head will turn up at the laboratory in the near future. Alcor treasurer Carlos Mondragon added that upon the head's return, he would be willing to let authorities visually inspect it at the lab.

Outside the courtroom, Kent's son, cryonics pioneer Saul Kent, 48, rejoiced.

"This is the first time that most people have taken cryonics seriously, although it may have taken my mother's death to call attention to it," said Kent, who moved his invalid mother from a

convalescent home to the cryonics laboratory to await her death.

Miceli stressed that he doesn't know whether cryonics is scientifically sound. However, he ruled Monday that an autopsy would destroy any chance Dora Kent might have in the distant future of being revived and her body restored.

He added that Kent, under state law, had the right to determine the disposition of her remains.

Miceli concluded the potential damages to Kent outweighed the coroner's arguments, which failed to show that an autopsy would yield any specific clues to the woman's death.

"He must show there is some reasonable expectation they're going to get some information out of (an autopsy) . . . not just to see what we can find," Miceli said in an interview later.

"(The coroner) does not have unrestricted right in conducting investigations," Miceli said.

Carrillo has maintained he can't attribute Kent's death to natural causes until her head is examined to rule out foul play or negligence.

An autopsy conducted on Kent's headless body, which was released by the coroner's office

for cremation, indicated she died of pneumonia and clogged arteries. Alcor officials contend any evidence found by examining the head could also have been discovered during a thorough autopsy of the now-destroyed body.

Coroner's investigators refused to comment after Monday's hearing, and issued a one-line statement saying the investigation into Kent's death is continuing.

nanotechnology, molecular biology, robotics, and information theory. A declaration was also obtained from a top-flight forensic pathologist which supported Alcor's position that autopsy of Dora Kent's brain would yield no useful information that could not have been obtained from examination of the body.

Alcor was represented in Superior Court by Christopher Ashworth, a noted constitutional attorney. Ashworth's pleadings and his excellent preparation of our case were instrumental in our winning the PRO. But beyond technical excellence there is the matter of Mr. Ashworth's STYLE. Ashworth is witty, saucy, and in total command of the courtroom when he has the floor. And when he doesn't have the floor his presence looms even larger -- he is the proverbial tough act to follow -- with a vengeance. His grasp of complex technical issues is immediate and superb, and he speaks in phrases which demand quotation.

"Dora Kent didn't go through all this crap to have her brain end up in a blender" is an example of one of the blunt but effective Ashworth statements that ended up as bold print in one of the local papers. We owe Linda Abrams a debt of gratitude for recommending Mr. Ashworth early on in the emergency.

The Coroner's office may appeal the ruling of February 1st to a higher court. But if they choose to do so and lose, they will have set a precedent with the force of law -- a precedent which might seriously alter the way coroners do business throughout the United States. We think we have an excellent chance of winning such an appeal -- and apparently so does the Coroner. Rumors are circulating to the effect that the Coroner's office does not plan to appeal the ruling. The following pages contain newspaper accounts of our PRO victory. For many of you they will be the only objective coverage you will see of our struggle.

CURRENT EVENTS

As of this writing (Feb. 15th) the Coroner still has the Alcor computers, files, and patient records. A variety of legal maneuvers is underway to recover these items as well as damages. A top priority is recovery of the patient records -- or at least a copy of them -- as soon as possible. So far we have secured a copy of Dora Kent's suspension files and records. The others remain in the hands of a Coroner who refuses to communicate with us and who has, so far, refused to allow even a copy of these critical records to be made and put in back in Alcor's hands.

Status of UCLA Police Action

The status of the Alcor property removed by the UCLA police is more hopeful. UCLA officials have "cleared" about 90% of the items and will be returning them to us in the next few weeks. A number of items we purchased either lack proper records (on UCLA's end) or have been reported stolen within the UCLA system despite the fact that they were sold to us by the UCLA Surplus and Excess Property Department (SEPD).



Fortunately, we have employees in the SEPD who remember selling us many of the "questioned" items and we are hopeful about a favorable resolution to this matter over the course of the next month or two.

One thing we are learning the hard way. Property is taken from you quickly by the state without any opportunity for explanation or justification. Getting it back requires enormous amounts of time, effort, and money. Once an "investigation" is under way, nothing happens quickly and fast resolutions are the stuff of movie thrillers. In some instances Alcor may be in court for years to come over property or other matters relating to this incident.

Wound Healing

Life is slowly returning to some semblance of normality here at Alcor. We are currently using the computers of several members to do routine administration and put out the magazine. This situation will probably continue for some months to come.

There have however been a number of important changes in Alcor operations which members should know about. Hugh Hixon is no longer working at the Alcor facility on a full time basis. Due to the enormous expenses associated with Alcor's litigation with the Coroner, money for consulting fees and salaries has virtually vanished. Hugh is being used only for critical help areas and is now pursuing full time employment outside cryonics.

Mike Darwin is still working full-time at Alcor, as is Dr. Mike Perry. A nearly full-time schedule of volunteer work is being put in by Arthur McCombs at the facility, and by Carlos Mondragon at home. At this time Carlos Mondragon is acting president of Alcor (see article below).

There will be a number of critical changes in Alcor's administration. The Coordinator program will be further strengthened and better communications between Alcor Officers and Coordinators will be implemented. There will be further decentralization of Alcor's basic administrative operations and redundant storage of critical patient care and routine administrative files. Many of the changes which will be made should go a long way towards improving the safety and security of Alcor.

While the situation at Alcor Southern California remains one of "medium concern" (we are at about Defcon 3) we are not at the moment in a "bubbling crisis". Over the past several days we have had a Public Health Service inspection and a Fire Department inspection. The PHS inspection was for issuance of an infectious waste handling/disposition permit which is required by state and county law. We just recently found out about this law (and in



fact Riverside County only began to enforce it about 11 months ago!) and had to make a few minor changes in our procedures to be in compliance with law -- for one thing, having arrangements with a state-licensed contractor for disposal of infectious wastes. Alcor passed the inspection with flying colors. Of the 46 items required of us, all were met and no violations were present. The fire inspection resulted in a similar clean bill of health.

However, we have one major hurdle to get over before we can relax even a little about prospects for remaining here in Riverside. The city is requiring that we obtain a "conditional use permit" from the Zoning Board/City Council. Such permits are intensely political things -- they are issued not only on "objective criteria" such traffic congestion, parking, and so on, but on intangible criteria such as "do we want you people in our community". This may be a rough one to get. We have retained an excellent governmental relations firm to help us through this process and we are hopeful. But we will not know for sure what our chances are until we have our hearing on or about the first week of April.

That is the situation as it stands now.

Some Questions And Answers

We have received many questions from members and others about the events of the past few weeks. What follows are a few of those questions and answers:

Q. Has the Alcor Patient Care Fund been "guttled" by the legal expenses associated with the police action against cryonics?

A. No, no PCF money has been spent on legal expenses to this point and we are currently in a break-even mode on legal expenses in terms of incoming money. The only expense the PCF has experienced is the need to provide up-front a \$3000 deposit to our liquid nitrogen supplier so that we can continue to receive liquid nitrogen deliveries -- the containers that the liquid is delivered in have a replacement cost of about \$1500 each and the company will no longer extend us "credit" in regard to trusting that they will get the containers back after each delivery.

Q. Was the removal of Dora Kent from the facility an illegal act?

A. No. At no time were Alcor personnel, or anyone, for that matter, instructed not to move Mrs. Kent. On December 23 we were told that the investigation into Mrs. Kent's death was closed.

Q. Is Alcor able to perform suspensions?

A. Yes. Our capability to respond in an emergency (excluding field total body washout) is the same as it was before the police action against us.

Q. Will patients be brought into the Alcor facility prior to pronouncement of legal death in the future?

A. No. Patients will have to be pronounced legally dead by a physician not associated with Alcor and preferably in a medical setting -- away from the Alcor facility, in order to avoid any possibility of conflict-of-interest charges.



CHANGING HORSES: A NEW PRESIDENT FOR ALCOR

by Mike Darwin

As the astute reader of CRYONICS has probably gathered, I am no longer President of Alcor. In some quarters there will probably be rejoicing over that fact, and in some quarters there will be sadness. Whatever the reaction from others, I think the reaction from me is worth knowing about: relief! Someone recently asked me how I felt about not being President of Alcor anymore. I responded by asking him how he would feel if he was suddenly offered a feather mattress after sleeping on a bed of nails for 6 years!

I have found being President of Alcor an enormously interesting and challenging job. However, I must say that I have NOT found it an enjoyable one. I know that I am a leader, but I also know that I am not an administrator. I detest the day-to-day paper shuffling and politicking that it takes to run Alcor -- or any organization for that matter. I have long protested my inability to do the job well, as well as the undesirability of my continuing to do so.

At the February 7th Alcor Board of Directors meeting, I officially tendered my resignation as President -- and it was accepted by the Board. Frankly, it was a relief. Carlos Mondragon's crisis-tested, capable hands will now be steering the ship as acting President on a day to day basis until a long-term successor can be found. I feel very strongly that the length of term that **anyone** should serve in the position should be limited to no more than 4 years. It is a grueling and thankless job -- largely because it involves life-or-death decisions in the absence of any reasonable resources and in the presence of enormous unknowns. Little questions come up from time to time which are incredibly hard to answer with any degree of certainty: "Should we move a patient out of the facility to avoid precipitate and unjust police action?"; "Should we take a last-minute case where the person on the other end is begging you to help him save his father's life?"; et cetera.

I have had too many years of being in the position of responsibility for answering questions like that -- and carrying the burden of other responsibilities as

well. Frankly, my heart is in other matters and has been all along. My strengths are in long-term planning and in guiding the overall course of action for Alcor, not in the day to day of paperwork and "business" of Alcor.

During the years I have acted as Alcor's President there has been a widespread and mistaken belief that I "ran" Alcor and that others were of only peripheral importance. That has never been true. This recent crisis has proven that to all those within Alcor I hope, beyond any shadow of a doubt.

I love this organization and I believe in it. I have no doubt it is the best and I intend to continue to work just as hard in the future to see to it that it remains so. I intend to be a relentless gadfly for high quality services and I will still be here in the facility on a day-to-day basis, working full time for Alcor as long as the Board of Directors thinks I should. I see little change for Alcor except for the better -- a more efficient administration and better day-to-day operating capability.

In the long run, I see myself as having more opportunity to affect the broad direction Alcor is going in. I intend to remain at the forefront of the creative end of Alcor management: public education materials and strategy, research and development, and contingency planning.

Several people have called to ask if I was "removed" from the Alcor presidency. The answer to that is "yes". But not by the Board or the members, but rather by the excruciating stress of doing a job that I was not well suited to do and that neither I, nor anyone else for that matter, has adequate resources to do. The resource problem is a serious one, and is hardly new to cryonics. I summed up my feelings on this matter to New York *NEWSDAY's* Elizabeth Sanger in an interview which was given a month or so before Dora Kent's suspension:

The bottom line is: *"Will the believers come back to life?"*

Darwin's response: *"Here's this little band of 100 people in a little warehouse in Riverside, California with about \$50,000 in the bank, and they propose to keep people frozen for hundreds of years, if necessary. What do you think the odds are?"*

Conceding they are tiny, he quickly adds: *"But then, there is no alternative. Well there is, but it's an unacceptable one to me."*

So there you have it, the recipe for job burnout. Burnout occurs, I am told, when the expectations of a person's performance (either internal or external) are way up there, and the reality of job performance is way down there. It's a Sisyphian position. Always rolling the impossible rock up the impossible hill.

I have some advice to offer my successor. Be gentle with yourself. Be hard and demanding of the best, but realize the limitations you have to work within. Above all, realize that you are no one's daddy or mommy. The Presidency of Alcor does not come equipped with a magic wand to right all wrongs or soothe all hurts.

One of the most frustrating and potentially emotionally damaging things about the job of Alcor President is the pressure to bail people out from their own irresponsibility. In the closing months of my tenure as Alcor President I began to learn the lesson that you can't protect everyone from their own irresponsible

actions. Adults are not children. It is thus essential that you set sharp limits on how much caring you do. For me, a very hard and painful decision made early on in my Presidency was the one not to take last minute cases because of the issue of informed consent. That has been an enormously painful thing to have to stick to.

When a last minute call comes in in the middle of the night and the person on the other end of the line is begging you to help them -- and that is in the nature of your job -- to be there to help, and you can't -- it's just awful. I hope my successor, whoever he or she is, can sleep easier after they have said "no" and perhaps consigned someone to oblivion, than I was able to. Know that you are not alone -- that at least Mike Darwin has been there -- and that you can call him to commiserate. And know also that saying "no" is the right decision to make. As President you will soon find that you are not God, or even an angel, and that you cannot mend all the hurts or save all the lives. I hope you will learn, sooner than I did, that you should be grateful to be able to save the people you can -- the members of Alcor who do what needs to be done when their time comes.

To those of you who have provided the enormous support it took to keep me going as long as I have: my deepest thanks. You will never know how much the word of encouragement or praise meant. Each thoughtful bit of support was like encountering an oasis in the desert. You know who you are. You believed in me and you believed in Alcor. I just ask that you keep believing. Because while I'm not going to be President anymore I'm still going to be here and I'm still going to be behind Alcor 100%.

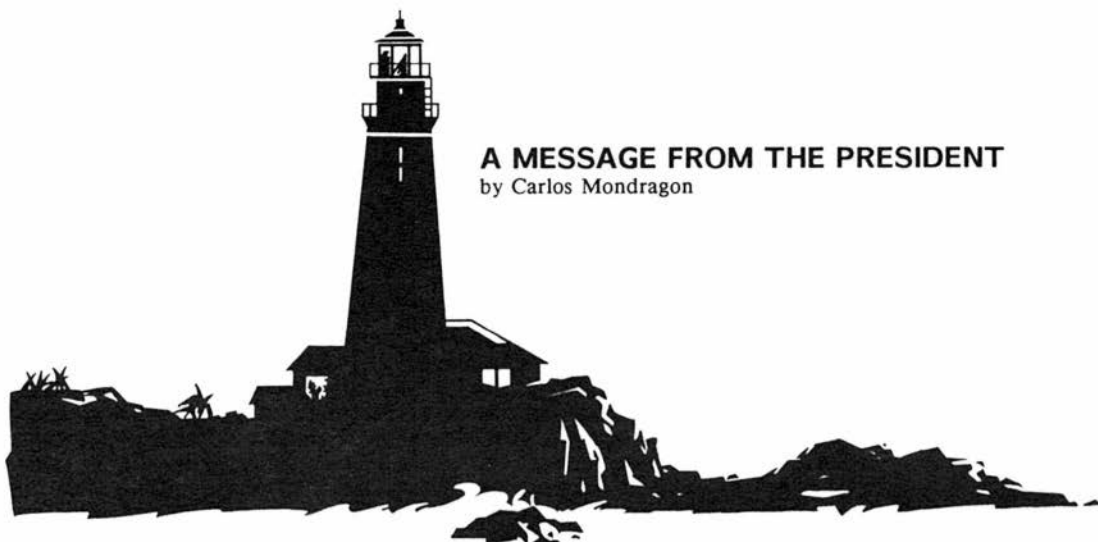
It has been a marvelous and amazing 6 years. The twists and turns and triumphs and defeats have been the stuff of Alice's Wonderland. The reality of cryonics has been far stranger and more marvelous than any fiction. Saul Kent says he doesn't read fiction or suspense novels anymore because they bore him. I can say the same. Often when I watch a suspense thriller on TV I feel nothing so much as mild amusement at the troubles of the hero or heroine. Sometimes I feel a mild sense of envy -- if only I could be so lucky as to have such problems!

And there has been an unexpected bonus in all of this. I have learned to enjoy life's little moments a hell of a lot more. I cannot tell you how precious a quiet evening has become, or the arms of a loved one. Any moment of emotional peace has become a richly treasured thing. Love and support and loyalty have taken on worlds of meaning I cannot begin to put into words. I owe the "stress" of the job a debt of gratitude for making me appreciate just how good the "everyday" business of living is. Once again, cryonics has succeeded in giving me back life. I am thankful for that.

In spite of all the stress and all the heartache it has been worth it. Don't any of you, friend or foe doubt that for one minute. I look over my years of Presidency of Alcor and I am very, very proud at what I have done and achieved. I have not always been right, but I have played a pivotal role in building a quality cryonics organization which has been leading edge in every way -- technically, medically, scientifically, and yes, even legally. I leave a proud legacy and I am not ashamed to say so.

Even our troubles with the Coroner occurred because what were doing was leading edge. We have been the best and we still are. Long may we be so!

I am going, and yet I will not be gone. Au Revoir.....and Hello!



A MESSAGE FROM THE PRESIDENT

by Carlos Mondragon

On February 7th, 1988, I was elected by Alcor's Board of Directors to be its President. I imagine that many of you have never met me, or never heard of me. My involvement with cryonics dates back to 1978, when I was 22 years old. Since 1982, I have had cryonics arrangements with Alcor. For the past year, I have served on the Board of Directors and as Treasurer.

I do not expect to fill Mike Darwin's shoes. His range of skills and knowledge encompass nearly everything that relates to cryonics. Under Mike's direction, Alcor has accomplished more than any other cryonics organization, and he did it with very limited resources. Most importantly, every decision he has made and action he has taken has been for the good of our patients and our suspension members.

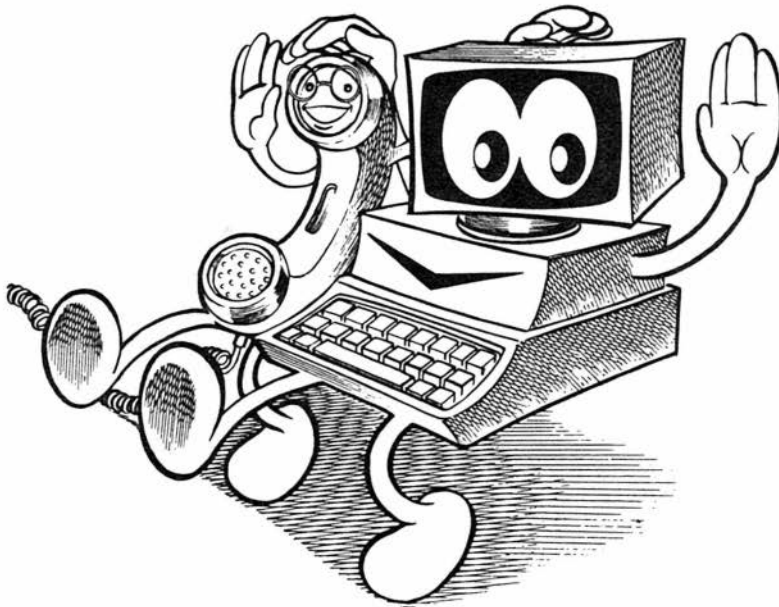
When I joined Alcor, there were 25 suspension members, now we have 100. Even before the recent crisis, Alcor was beginning to suffer from the lack of professional administration. It is in that area that I expect to make a valuable contribution. While our strength in research, suspension capabilities, and storage technology is by far the best available, we have yet to put in place the management structure needed to support our day to day operations. No, I don't intend to establish a bureaucracy -- just get things under reasonable control.

The victories we've won are impressive and encouraging. Ultimately, I think we will survive and have the opportunity to thrive as never before. But for now we are still operating in a crisis mode. This means that for the next few weeks, as we dig ourselves out of backlog of paperwork and mail that have accumulated, some things will undoubtedly fall through the cracks. Many of you have contributed generously to our legal defense fund. I am sorry that not all of your contributions have yet been acknowledged personally. In some cases we may not even have a record of your contribution. Please, give us some time to sort things out. If you DON'T receive an acknowledgment of your contribution within a month or two, please drop us a line and let us know what you sent. Not only do we want to be sure to thank you, we want you to know that we received your contribution in the first place!

The coming months will see a number of changes in Alcor's administrative

structure. One of these changes has already been made: In order to assure proper completion of suspension arrangements for new members, we have gone to an up-front free system so that we can begin to rationally address the cost of signing people up. Right now it takes on average approximately 10 hours of Alcor personnel time to move each new member through the sign-up process.

In the past, this has been handled exclusively by volunteers. The complexity of the task and the time involved coupled with a large surge in the number of people signing up has made it imperative that we move to a more realistic system. Thus, effective as of February 7th, Alcor will require a nonrefundable fee of \$300 to cover the cost of making suspension arrangements. The dues structure will remain the same. For those who purchased a SUMS set before February 7th, you will not be charged the \$300 sign up fee providing you complete your suspension arrangements within the next 4 months (i.e., by June 7th).



As part of the repair and regrowth process following the police action against Alcor I intend to strengthen and expand our Coordinator program and quickly bring on-line our computer Bulletin Board System (BBS). I firmly believe that if Alcor is to survive it must move in the direction of maximum flexibility and redundancy. The extent to which we got through this last crisis was in large part due to the redundancy and inherent networking which was built into the system. It was very reassuring to know that during the 30 hours the Alcor facility was occupied by the Coroner's office our ability to acutely stabilize and transport members was still intact due to the presence of regional coordinators with equipment and medications.

Had a member "gone down" during that period of time the Coordinators would have been able to act -- and by the time the member was cooled and transported, Alcor Southern California would have been free to operate again. We need more of that kind of redundancy and we need it extended into all aspects of our operations. Good communication and redundancy will thus be high priorities for us in the coming

months.

If you have problems or suggestions with any aspect of Alcor's operations I welcome hearing from you. Feel free to call and discuss your concerns and offer suggestions. And of course, if you can offer skills or support -- let me hear from you about that too!



ALCOR PRESS COVERAGE

It goes without saying that there has been an avalanche of press coverage about Alcor of late. Many of the stories were sensationalized and misleading in the early days of the battle. More recently, there have been a number of very thoughtful pieces which cover what we are doing in detail. We have certainly done a great deal to raise the consciousness of the western world about cryonics in general and neurosuspension in particular. We have had stories sent to us from Europe, Canada, and Australia -- even India!

We have also had a hefty increase in information requests as a consequence.



There have also been two large, thoughtful pieces to appear about Alcor and cryonics in major US newspaper magazines. The **Boston Globe Magazine** and the **New York NEWSDAY Magazine** both ran extensive 10,000-word plus articles featuring Alcor and other cryonics organizations. The **Boston Globe** article by Susan Trausch was excellent. We hope to be able to offer reprints of it in the near future.



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POT-SHOTS NO. 3623

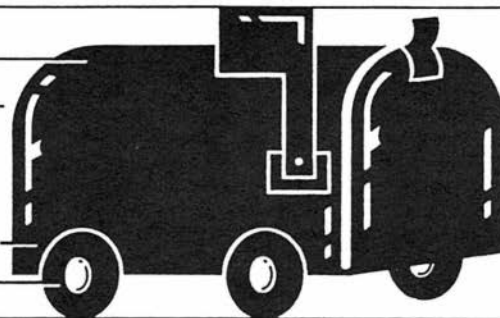
**MIRACLES HAPPEN
IN DREAMS,**

**BUT
THE GREATEST
OF ALL MIRACLES
IS
TO WAKE UP
AND BE ALIVE.**



THIS IS ONLY ONE OF HUNDREDS OF DIFFERENT POT-SHOT CARDS. IF YOU CAN'T FIND MORE AT YOUR LOCAL STORE, WE'LL SEND YOU A STARTER SET AND CATALOGUE FOR \$2.00. WRITE TO BRILLIANT ENTERPRISES, 117 M. VALERIO ST., SANTA BARBARA, CALIFORNIA 93101

*Letters to The
Editors*



Dear Mike:

This letter is to express appreciation to you and the Alcor staff for your efforts in recent weeks, and to convey my strong support for you both personally and as the President of Alcor.

I do not believe that there was anything significant that could have been done to avoid the situation which developed in the suspension of Dora Kent. People who were not there (with the advantage of hindsight) can usually find fault with anything. I am sure some will do so. But to the best of my extensive knowledge of the facts, conditions, and events, I think you and the other people at Alcor did a magnificent job in the face of the most serious challenge that has ever faced a cryonics organization. I believe that the confrontation was unavoidable and was based on factors outside of Alcor, particularly the news media and the personality of the Coroner of Riverside and his staff.

I don't know who moved Dora, but it was, beyond any doubt, the correct action. Hiding Dora allowed slow-to-muster legal and political forces to come into action. If this heroic holding act had not been done, all the subsequent efforts in the world would have been moot. I know you, Hugh Hixon, Arthur McCombs, Mike Perry, Carlos Mondragon, and Dave Pizer took the heat for it, and that Steve Harris and Jerry Leaf have risked their careers. Words do not exist to adequately express my appreciation to all involved.

My confidence in cryonics as a workable technique in the face of social difficulties (always my most serious worry) and in Alcor as an organization of dedicated people has greatly increased.

Very truly yours,
H. Keith Henson
San Jose, CA

* * *

Dear Editor:

Enclosed find a sample of our new cryonics support items, lapel pins and bumper stickers which I would like to give to you or your organization. I am writing to ask if you would give our merchandising of these items some space in your magazine. The lapel pins are suitable for men or women.

We are desirous of mustering support for cryonics research and hope these items might allow cryonicists to display their feelings. The pins could be excellent conversation starters at public gatherings. I recommend a cryonicist wear one every day.



I ♥ LIFE

SUPPORT CRYONICS RESEARCH

The pins are \$6.00 each postpaid (2 for \$10.00).

The bumper stickers are \$2.00 each postpaid. In quantity they are:

2 for \$3.00

5 for \$6.00

Cryonics supporters may order by sending a check and their address to:

The Venturists
1355 E. Peoria Ave.
Phoenix, AZ 85020

Thank you for your consideration.

Sincerely,
David S. Pizer
Phoenix, AZ

* * *

To the Editors:

I would like to compliment Mike Darwin and Steve Harris for their article on "Reducing Your Risk of Autopsy, Part II: The Problem of Atherosclerosis". I feel this is an important subject which is of concern to many cryonicists and I am happy to see such articles in the pages of CRYONICS.

I would very much appreciate receiving a copy of the reference on cooking egg yolks (Pollack, 1958) as it is difficult for me to get to a medical library. You state that frying or hard-boiling egg yolks is "very effective at raising serum cholesterol in rabbits..." and that the paper suggests "that the oxidation products of cholesterol have a direct role in raising serum cholesterols." This is easily understood with fried eggs, but since hard boiled eggs have neither been exposed to air or fat at high temperature, this seems curious. I've been hard-boiling eggs, as this seemed the safest way to cook them!

In spite of the high value of the article in general, I was disappointed that the dangers of sugar in the diet were played down so dramatically. Being one of the people who has sent numerous medical references to Mike Darwin over the past years about the dangers of sugar consumption, I feel readers of CRYONICS who are concerned about their health habits deserve to hear more than this article gave them.

In support of the advice against fat and cholesterol in the diet, the article mentions both the Pritikin Program and the famous Framingham Study. The Pritikin Program is referred to as one "which emphasizes profound reduction of both saturated and unsaturated fats and emphasizes consumption of unprocessed foods rich in natural antioxidants and fiber." This neglects to point out that Pritikin says on page five of his own bestseller (*The Pritikin Program for Diet and Exercise*, Bantam Books, 1979, Nathan Pritikin and Patrick McGrady, Jr.): "Well, some carbohydrates are banned by this diet, too. Those are the highly refined sugars of all kinds, honey, molasses, and syrups. They are basically monosaccharides and disaccharides -- and are bad for you. We eliminate them altogether." The book goes into more detail about the reasons for the elimination of sugar from the Pritikin Program.

In the section where you mention the Framingham Study, you conclude (as does the Framingham Study) that atherosclerotic disease is a multifactorial disease. You state that these factors include hypertension, smoking, stress, alcohol intake, sex, heredity, diet, and (most importantly) age. You neglect to mention that Framingham included elevated blood sugar levels as a risk factor. It also concludes that "Most highly susceptible subjects have problems with several risk factors. Management of one should not interfere with management of another if optimal health is sought."

The article uses the death of long distance runner Jim Fixx to point out that readers should not "dispose of a complex, multifactorial problem in a simple, 'easy' way. 'Just do this,' they say, 'it's simple'." And you go on to say that Jim Fixx was dead wrong in assuming he was invulnerable just because he could run marathons. For the same reason, I do not think we should discard any information about risk factors for atherosclerosis, nor do I think we should just pick and choose the convenient ones we want to eliminate and ignore others.

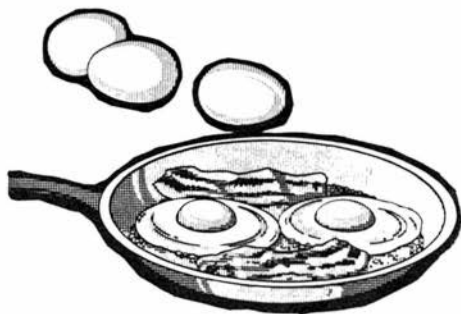
In 1985 I wrote an article for CRYONICS on the subject of dietary cholesterol and dietary sugar as they relate to atherosclerotic disease. Dietary sugar is discussed at length and the article had 66 references to medical literature and books on the subject. The article was rejected by the Editors of CRYONICS because they felt "the topic was inappropriate" for the magazine. However, any readers who are concerned about this subject and would like more information are welcome to write me for a copy of that article.

Long life and good health,
Linda Chamberlain
South Lake Tahoe, CA

Mike Darwin and Steve Harris reply:

Dear Linda:

We're sending the Pollack paper that you requested. We note that egg shells are gas-permeable (else chicks would be in deep trouble), and the fluids of any egg therefore contain dissolved oxygen. Presumably, this oxygen can cause the formation of cholesterol oxidation products with boiling, although the chemistry has not been worked out. Remember that in any case the oxidized cholesterol theory is more tentative than the overall conclusion that elevated serum cholesterol levels are hazardous. We mention the oxidized cholesterol theory for completeness sake (not as some sort of Final Answer), on the assumption that many members are not too fanatical about egg yolk softness, and might appreciate a nudge in an easy-to-follow dietary direction, even if based on more probabilistic evidence. Giving up cheese will be,



needless to say, more difficult for many.

Speaking of completeness, we do regret not having mentioned that (as you point out), diabetes is a terrible risk-factor for atherosclerosis, at least in Western societies (In Far Eastern vegetarian societies where a very different diet is consumed, mild diabetes is not a tremendous risk factor!). In fact, atherosclerosis is the major killer of diabetics in the U.S., just as it is for the U.S. population in general, despite the fact that diabetics live statistically somewhat shorter lives. Obviously, the atherosclerotic process is somewhat "speeded up" in diabetics here. Our lack of emphasis on this point resulted from the fact that our discussion was intended more as a health maintenance piece for well people, rather than a guide for members who have diabetes (the treatment of diabetes is complex and well beyond the scope of our article series). Nevertheless, we should have emphasized that at least half of the diabetics in this country do not know that they have diabetes, but that a single blood test is all that is necessary to ensure that the disease is not present. Members are well advised to have a blood sugar test yearly, especially if overweight.

Having said this, however, we feel that (in general) healthy non-diabetics do not need to worry greatly about dietary sugar intake. Our reasons for this depend on some of the same evidence that you cite. In the Framingham paper that you enclosed (*American Journal of Medicine*, 76 (supp 2A), 4-12 (1984)), it is indeed true that risk of atherosclerosis on a U.S. diet rises (slightly) for blood sugar levels within the normal range (see figure). However, the magnitude of the risk elevation for blood sugars within this normal "nondiabetic" range is small compared with the rise in risk associated with blood cholesterol within the range which is considered "normal" in this country. Also, the findings of the Framingham study have not been confirmed by more recent studies, such as the most recent Honolulu Heart Study, (*Am. J. Epidemiol.*, 126, 214-25 (1987)), in which hypertension, smoking, and blood cholesterol were found to be risk factors for atherosclerosis, but blood sugar levels were NOT.

Since average blood sugar levels in nondiabetic, non-obese people are not greatly influenced by dietary sugar intake, it is not surprising that there is little evidence connecting atherosclerosis with dietary sugar consumption. What little evidence there is comes from epidemiologic dietary studies in which it is difficult to separate the effects of dietary sugar from dietary fat (diets in developed countries tend to be high in both). In the "Seven Country Study," for instance, which is the largest and most comprehensive study of diet and heart disease ever undertaken for a living population, sucrose intake was correlated with saturated fat intake at an r value of .84 (an r of 1.0 is a perfect correlation). Not surprisingly, both were correlated with heart disease (and serum cholesterol). However, sugar intake was **not** correlated with heart disease after statistically controlling for the effects of dietary fat (this was done by comparing groups with similar saturated fat intakes, but different sugar intakes).

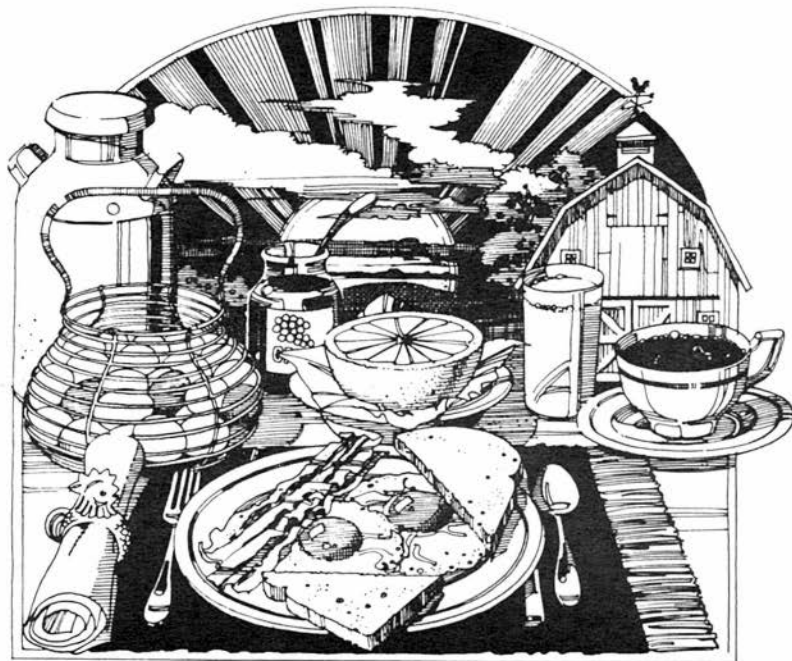
Animal studies in which effects can be more definitively separated, tend to implicate saturated fat as well. For instance, we are unaware of any animal experiment in which atherosclerosis is induced by feeding sugar alone. A great many studies have found that very high levels of sugar may modify or enhance the disease

produced by an already atherogenic diet (i.e., one containing high saturated fat), but it is not at all clear that the pathogenic levels of sugar in these experiments (40-80% of total calories) have any relevance to the U.S. diet, in which only 10-15% of the calories typically come from sugar.

By contrast with sugar, experiments in which atherosclerosis is induced in experimental animals by feeding cholesterol and/or saturated fat, are legion. Induction of atherosclerosis in pigs by this method is so reliable that it is used to test the utility of other anti-atherosclerotic regimens, such as consumption of fish oil. In addition, many studies have shown that atherosclerosis can be induced in monkeys, our closest animal relatives, by the simple addition to the diet of amounts of saturated fat and cholesterol similar to those found in the average American diet (In fact, it can also be reliably induced in monkeys by simply feeding them an American diet!). Further, and perhaps even more impressive, at least five studies show that the disease regresses in primates when the offending dietary fat and cholesterol are withdrawn.

This is not to say that some conflicting evidence does not exist about the relationship of dietary fat and cholesterol to atherosclerotic disease. Some of the confusion has been generated from inappropriate animal research models. Rats, for instance, unlike humans and other primates, are extremely resistant to diet-induced atherosclerotic disease, and this makes dietary saturated fat and cholesterol look unnaturally good (from our point of view) in rat studies. Other experimenters seem to have generated negative results in other animals by feeding unoxidized cholesterol alone.

Negative epidemiologic studies also exist, but all of these we know of make no attempt to differentiate total fat intake or "friendly fat" intake, from intake of



saturated fat, which is apparently the dietary component which is important in the development of atherosclerotic disease. In most population studies which look at type of dietary fat, only saturated fat correlates with blood cholesterol, and heart disease. Eskimos, who eat high-fat diets, do indeed have little heart disease, but they do not eat the same sort of fat that Americans do. A quantitative illustrative example which will serve here is the case of the Greeks and the Finns, who both eat diets deriving about 36% of the calories from fat. The Greeks, who only eat 7% of their calories as saturated fat, have average cholesterols of 201. The Finns, however, eat 20% saturated fat, and have average cholesterols of 259. In the "Seven Country Study," 10 year heart disease mortality for Greeks originally aged 40 to 60 years, was 9% (that is, after ten years, 9% had died). For Finns, the figure was 65%(!) The Finnish, by the way, are the only people in the world who eat more saturated fat than Americans, and they are the only people who have more heart disease than we do.

The late J. Nathan Pritikin did indeed advocate a stringent dietary program which was low in total fat, protein, salt, cholesterol, and sugar. His arguments against sugar, however, we find less than persuasive. It is true that truly massive amounts of dietary sugar in experimental diets can raise serum cholesterols in both animals and people, and Pritikin quotes studies to prove it. However, evidence that the more modest (by comparison) amounts of sugar in the American diet raise American cholesterols by a significant amount, is lacking. Pritikin's other arguments regarding sugar are:

- 1) **Sugar causes dental carries (cavities).** This is true enough, but it is also true that a clean tooth never decays. A dental hygiene program sufficient to prevent plaquing and periodontal disease (brushing after meals, regular professional cleaning, etc.) will also adequately protect against any amount of dietary sugar eaten with (as opposed to between) meals.
- 2) **Sugar represents "empty calories," and calorically replaces foods rich in vitamins and minerals.** This is also true as far as it goes, but is only important for hard-line Pritikin adherents who eschew vitamin and mineral supplements. For most of the rest of us who take modest amounts of vitamin and mineral supplements for other reasons (authors included), worrying too much about the relatively small amounts of vitamins and minerals lost to sugar calories would be (so to speak) gilding the lily.
- 3) **Sugar intake (independent of caloric intake) increases the risk of diabetes.** Here Pritikin merely repeats an old wives' tale which has no scientific backing.

On the other hand, in the absence of evidence that sugar is terribly harmful, there is a pro-sugar argument which we find persuasive: sugar helps a great deal in making low fat diets palatable. The Pritikin diet is somewhat difficult to tolerate, and in fact low fat diets in general are difficult to stay on (which is why most vegetarians love their eggs and cheese, and still have their heart attacks). The full-blown no-chances-taken Pritikin diet may be appropriate for people with diabetes, serious hypertension, or heart disease -- but for the rest of us with less tangible motivation, some liberalization which is not likely to change the effectiveness of the diet too much is in order. Since the evidence clearly argues that sugar is much less of a dietary risk than saturated fat or oxidized cholesterol, we feel that sugar is one of the obvious best additions to the Pritikin diet to make it practical for healthy people as a preventative, rather than therapeutic, regimen.



We do not wish to be overly simplistic about the mechanisms of atherosclerosis, which are complex and still only partially understood. In particular, we do not want to leave the impression that we think that high serum cholesterol is the sole pathogenic problem in atherosclerosis. They do, however, seem to be a highly important contributing factor to this disease, as argued by several lines of evidence. First is the finding (from several independent studies) that in countries in which populations have low serum cholesterol, even diseases like diabetes and hypertension produce relatively little heart disease. Second are a number of animal studies in which atherogenic insults like carbon monoxide and hypertension fail to produce atherosclerosis in the absence of a rich diet, but work admirably well when saturated fat is fed. Finally, there is the evidence from therapeutic trials that direct **drug** intervention to lower blood cholesterol slows, or even reverses, the progression of heart disease in humans (For instance, see *JAMA*, 251, 351-64 (1984), and previous studies cited in reference 1. Pritikin, intent on pushing his diet and denying that serum cholesterol was important, steadfastly ignored such evidence during his life.) It is interesting that as yet no comparable **direct** evidence exists regarding the advisability of controlling **blood sugar** levels to prevent heart disease, even in the case of diabetics for whom this interventive relationship ought to be much easier to prove.

In recent years, a number of pop nutritionists (Passwater, Pfeiffer, Shute, etc.) have spent a great deal of time de-emphasizing the role of cholesterol in atherosclerosis, and emphasizing various other links in what we now think is the

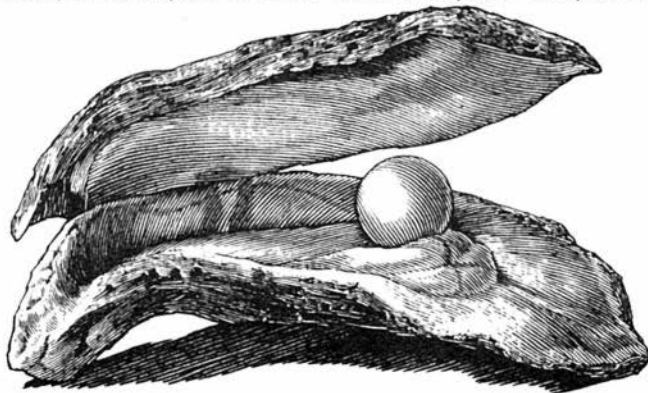
pathogenic causal chain of the disease. The reasoning behind the arguments of such popular writers is dreadfully repetitious: causal links not involving cholesterol might be affected by food supplements; therefore if you take the supplements, you don't have to worry about the rest of your diet or your cholesterol. Thus, we find Passwater arguing that free radicals are implicated in atherosclerosis (weakly true), and that selenium participates in one free radical disposal enzyme (also true) -- so therefore selenium prevents atherosclerosis. Unfortunately, one cannot work out such results in biological systems by "logic" alone. So far, Passwater's theories lack direct experimental evidence to support them. The same goes for Shute's Vitamin E theories of heart disease, and so on.

However, it is an unfortunate fact that books which push food supplements as cures for diseases are enthusiastically published by folks who sell food supplements. Such advice is not only profitable for publishers, but also easier to follow for readers. Staying away from sugary junk foods is a snap compared with staying away from saturated fat, and has the additional advantage that most foods in health food stores are not then off limits. Sugar and free radical theories have the common characteristic of generating dietary regimens that are even easier to apply than a modified Pritikin diet. In fact, for those with no willpower at all, the free radical theory alone can be used to justify any amount of dietary indiscretion: the photo of Durk and Sandy eating ice cream cones on the cover of their latest book is here commended to the reader.

As we have emphasized, however, there is a crucial difference between pragmatically scrapping difficult parts of dietary regimens for which there is little evidence, and doing away with difficult parts of dietary regimens for which there is much evidence. We firmly believe that the chief villain in the American diet is saturated fat, and that there is no convincing evidence that taking any number of pills, or giving up any amount of sucrose, will compensate to any large extent for eating too much of it. Nevertheless, we must add that we were not planning to write here the definitive treatise on atherosclerosis, and appreciate input from all regarding this still controversial subject. We fondly believe that the weight of evidence from the primary literature supports our interpretation best, but other sustainable opinions and comments are always welcome.

Steve Harris
Mike Darwin

1) We do not want to type out strings of references just for the sake of looking more convincing. For the very motivated reader, except as otherwise indicated, references for nearly all statements of fact in this letter can be found listed in the chapter "Population Studies" in the book *Nutrition, Lipids, and Coronary Heart Disease*, ed. R. Levy, B. Rifkind, B. Dennis, and N. Ernst. Raven Press, New York, 1979.



A HARD LOOK AT "SOFT OPTIONS"

by Steve Bridge

Mike's Darwin's article "Soft Options" (CRYONICS, November, 1987), disturbed me on many levels. Mike writes that one evolutionary advance humans need is better long-term judgment and then follows that with what he apparently sees as good and bad examples of long-term judgment.

Mike, in an uncharacteristically close-minded and disorganized essay, uses assumptions and half-truths to make a tenuous connection between gun control, nuclear disarmament, and ALCOR's assistance to new cryonics organizations. After the concept of long-term judgment is introduced, Mike throws in his personal beliefs on gun control and nuclear weapons as if they were self-evident fact, suddenly shifts into a defense of ALCOR policy, and ends with another appeal to "the legacy of Chatsworth." (For newer readers, since no one seems to explain this any more, "Chatsworth" is a small California town where the Cryonics Society of California had a suspension facility many years ago and where it allowed several suspension patients to thaw out, creating a public relations nightmare for other cryonics groups.) While the CSC story is a tragedy of great magnitude, its use in this particular article was of the "name dropping" sort for emotional effect only.



Let us first examine Mike's concept of "hard" and "soft" options. Apparently he believes these terms have meanings which we all agree on, since he does not provide a definition or explanation. It is possible to squeeze out a definition of sorts on soft options, which he describes as the "easier course of action to take." While he is even less specific about the opposite term, "hard" options, I take it he means the "more difficult course of action to take but which would be better in the long run." He implies that soft options are somehow "bad" in the long run and that hard options are "good," an absurd generality if you think about it. There are many options which are difficult to take, and many will turn out to be incorrect in the long run. What Mike really presents in this piece is that "soft" options are anything he disagrees with and "hard" options are anything he agrees with. There is no other logic to the definitions, as I will show. It is curious that Mike chose to make such a distinction anyway. Does he believe that he has already evolved a superior long-term judgment, and that future long-term reasoning will necessarily coincide with his current opinions? Or is it just possible that Mike might be afflicted with the same limited abilities that the rest of us have and that his judgments of what should be done in the world (and even in ALCOR) could be equally or even more short-sighted?

To understand Mike's viewpoint on ALCOR's options, we have to examine his position on gun control and nuclear disarmament, since he uses these as analogies. While a discussion of the ethics of gun control and nuclear disarmament should really be beyond the scope of this magazine, Mike brought the subjects up first and I feel a reply is required. Also, quite honestly, I do not feel pleased about being given, however obliquely, as an example of "poor long-term judgment."

Mike's statement that advocates of gun control want to ban guns or strictly limit their use is true in a sense; but as a description of reality, it is only useful as a catch phrase to inflame National Rifle Association members. Sure, the ultimate pipe dream for many of us is that guns and nuclear weapons did not exist, and that people didn't need weapons anyway because no one wanted to kill each other. But most supporters of gun control are not idiots. 99% of us know that perfect peace on Earth will never happen. The human race is a volatile species and all we can do

is to put limits on the worst aspects of that. We can provide laws and law enforcement; we can provide alternative ways to resolve conflicts; and we can attempt to see that the least responsible members of our society get less access to ways to destroy other people. Keeping guns, especially handguns and automatic weapons, out of the hands of these people, seems like a reasonable step.

The National Rifle Association and many other people apparently believe that the gun control activists are out to get their shotguns and rifles. This is not true. The primary focus of the gun control movement is not on eliminating guns but eliminating **handguns**, those easily concealable weapons which are the first choice for holdups and family shootouts, or at least limiting their access to those people who are likely to use them responsibly. "Responsible people" might include those over a certain age, those who do not have records of criminal or aberrant mental behavior, and those who are willing to take a required firearms safety and competence course. Why should just anyone under any circumstances be allowed to carry a handgun? We don't allow people to drive automobiles or fly airplanes without a limited test of competency and responsibility. About 10,000 people a year in the United States are murdered by persons using handguns, about 50% of all murders. There are somewhere in the neighborhood of 60 million handguns in circulation in the United States. We would also like to prevent the unrestricted sale of things such as "cop-killer" bullets and machine guns, the sale of which are supported by the NRA.

Mike's statement that gun control people want to take the easy way out by eliminating "choice" is a gross oversimplification and quite ironic when you compare it with his glowing recommendation of Swiss society. You see, Mike didn't tell you the entire story (maybe he has only read the NRA material on this). All Swiss men are required to undergo military training and to learn the use of military rifles and pistols. After their training they are required to take the rifle and ammunition home with them. The government keeps an exact record of who owns which guns. Commercial sales of guns, especially handguns, is **extremely** limited, and registration is required. (Information is from **Guns Don't Die -- People Do** by Pete Shields, Arbor House, 1981.) There is no comparison with the United States at all. It is a nation which understands both the benefits and dangers of weapons and which has made a conscious decision to take both into account by promoting responsible use and control. They have done this precisely by **REMOVING CHOICE**. You **must** serve in the military. You **must** learn responsible behavior. You **must** register your weapons. The **government** decides who will and will not own weapons. I wonder what advocates of free choice would think of compulsory military training and gun registration in the United States.



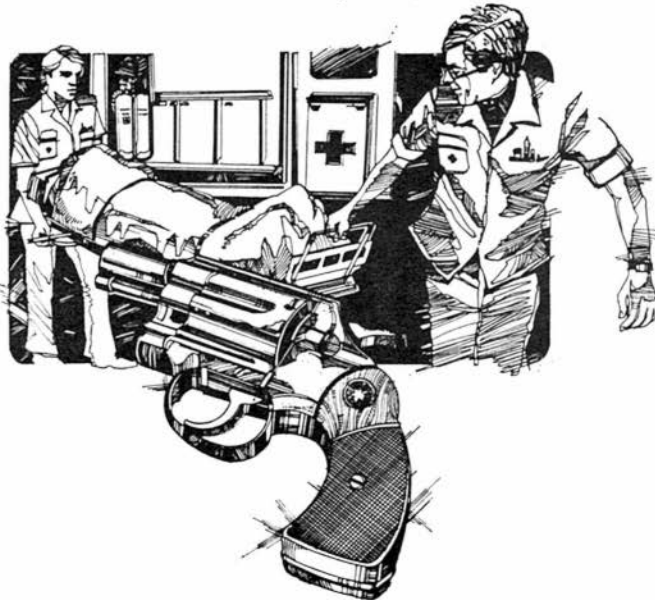
Mike goes on quite a bit about the "responsibility" of gun ownership. "If it is responsibly owned, it means there is a citizen out there who is in sufficient emotional control of himself to handle a weapon responsibly -- an incredible asset." First, as a simple statement, it is illogical through circular reasoning: "a responsible gun

owner is one who handles a gun responsibly." Even beyond that, the reasoning is illogical and somewhat frightening. Is Mike proposing that we use gun ownership itself as a test of responsibility? Do we just give people guns and then see which ones use them responsibly? What do we do with the ones who don't? Just duck? Responsibility must be tested in other ways before dangerous tools are handed to people. The whole point of gun control advocates is that too many people are **not** in "emotional control" of themselves, that these people are **not** responsible owners of firearms, and they should not be allowed to possess firearms.

How are we to see that firearms are used responsibly? Talk about it? It is certainly not gun control advocates who have undercut every attempt to bring responsibility into firearms use. The National Rifle Association talks a good line about teaching responsible use of firearms; but it has opposed **every attempt** of any kind to toughen gun laws. They have stated publicly that their lobbying agenda emphasizes the total repeal of **all** federal handgun laws, including those laws which provide for a background check on criminal or violent behavior. One California State Senator has been trying for several years to pass an amendment to the state constitution which would take away all authority from the state legislature to enact handgun laws. How do these actions promote responsible use of firearms? They certainly do nothing to promote public safety.

A few years ago California made a timid attempt to provide some mild control of handguns. Proposition 15, as it was called on the ballot, would have required both registration of handguns and a short waiting period to check criminal background. This measure was wildly opposed by many people, including Roy Rogers and Mike Darwin, as being an infringement on their basic rights. This despite the fact that both Roy Rogers and Mike Darwin were responsible citizens who certainly would have qualified for gun ownership.

I am willing to admit that, given the current situation, I would favor a near-total ban on handguns. Since the gun supporters seem unable to support anything less than "let anyone buy anything," they are the ones who have pushed the other side into an equally radical stance. If one side says "all", the other side is likely to say



"nothing". With no structure in place or ever likely to be in place to promote their safe use, elimination may be the only option left. I believe the harm handguns do is far in excess of the good that they can accomplish.

Some people feel that there should be no preventive laws; that laws should be few and then only deal with the consequences of inappropriate actions. If you kill someone, you must pay for it; but you should not be prevented from killing someone. This approach is the extreme in shortsightedness and is very close to the approach being advocated by Mike. He talks about responsibility but appears to think it will come about because people talk about it. This is as naive as believing that people will stop wanting to kill each other. It won't happen. We cannot force people to be responsible. We can only limit their actions if they prove not to be so. An essential limit is on their access to firearms.

Mike also seems convinced that individual ownership (unregistered, of course) of guns is important to keep a police state from taking over our lives. I have no desire to trade individual freedoms for that of a police state; but today we are heading in the opposite direction -- toward anarchy and the rule of whichever local gang has the most guns. Surely we do not have to fall to one extreme or the other. Here might be a good reason for the Swiss system. Requirement of universal military service (as much as I would personally hate the thought) might be an excellent way to help prevent a military takeover of the government. The military would then have a high percentage of members who owe more allegiance to the civilian government or to themselves than they do to the military leadership.

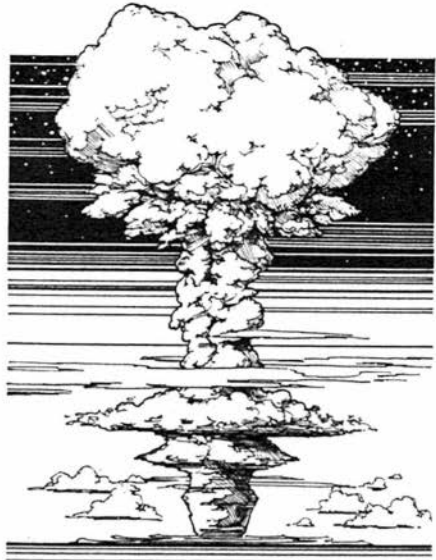


Perhaps the Swiss system is best. Perhaps every male and female should be required to provide two years of military service to the country. Perhaps each should be required to retain possession of their weapons and get frequent tests to establish competency and responsibility. Perhaps possession of weapons of any kind should be limited to those who can prove their responsibility and competence. Whatever decision is made, choices are lost and someone's freedom is restricted. But sometimes freedoms conflict and we have to choose between two different ones. I believe my freedom from being murdered is more important than Mike's freedom to carry an unregistered weapon without proof of responsibility.

Then there is the issue of nuclear disarmament. I would agree that people who advocate immediate total nuclear disarmament (especially unilaterally) have a severely limited vision. However, I would counter that advocacy of the status quo -- the continuation of the nuclear armaments race -- is equally short-sighted and an equally soft option. The hard option is recognizing the real differences between people of different countries, cultures, and (especially) languages, and constructing bridges which will allow them to share the same planet. A person with truly long-term judgment will recognize that biological weapons will be here in not too many years which will require worldwide cooperation and yes, some curtailing of "choice" if the human race is to survive. As a cryonicist, I include myself in that continued human race and don't want it to end. An enhanced intelligence and a longer life span may enable us to find ways to cooperate instead of finding ways to go to war. No one who is really paying attention to the current arms reduction talks believes that eliminating a few missiles in Europe lessens our ability to destroy each other. Thus far, the proposed changes are more symbolic than real. But as symbols, they can be very powerful. Someone has to start talking instead of throwing things. Maybe this won't be the first step toward world cooperation. But someday there must be a first

step in that direction, or there may not be much for us to come back to.

There is one more paragraph that bothers me greatly. Mike writes about "the issue of the reality of occasionally having to settle your differences with someone by killing them." To Mike, killing is a "hard option", and he goes on to say that "negotiation and compromise ... are soft options." This is a frightening reversal of reality. Killing, in fact, is a pretty soft option, an easy decision, in most cases; thousands of people do it every year. Do you think that these killings are the products of well thought-out decisions, weighing long-term effects with short-term effects? Of course not, and I am not convinced that any such decision by Mike Darwin to kill someone would be any more well thought-out. Anyone can convince themselves that killing their enemies is the only rational approach. It is a much harder decision, but possibly a more productive one in the



long run, to find ways to prevent the killing.

In each of these issues, it seems to me that it is Mike himself who is taking the easy way out. Can there be any approach less a product of long-term judgment than "do nothing, keep the status quo"? Can there be any approach more short-sighted than claiming that everyone who is trying to make changes is avoiding "growth and responsible behavior"? How does this really relate to ALCOR policy? ALCOR has always been a **do something** organization, not accepting the status quo, not accepting those people who tell us that **dying** is "responsible behavior." ALCOR, and Mike in particular, have looked at problems and found ways to solve them, have looked for future problems and sought ways to **prevent** them. Why should such an approach be sneered at when applied to other problems of society?

And how did all of these issues get mixed up with ALCOR's decision not to support the Cryonics Society of Canada? In reading the full discussion in another article, it seems clear that ALCOR should not support the Canadian group. It is a common sense business decision and seems to require none of the belligerence and emotional self-defense put forth by the editorial.

The members and leadership of an organization such as ALCOR must continually re-examine its policy and its decisions. If the policy begins tilting toward statements about the necessity of "killing one's enemies" instead of "strengthening one's organization", then we must wonder about the emotional health of the leadership. And we must wonder whether decisions based on similarly skewed notions of long-term judgment are being made elsewhere in the organization.

While gun control and nuclear disarmament themselves may be side-issues to cryonics, understanding the basis on which an organization makes its decisions is not. While Mike Darwin is one of the best friends I have ever had, and while I admire him greatly, there are many areas of disagreement between us. It is essential to the long-term survival of ALCOR that the entire framework of ALCOR policy not be from the mind of one person. Someday Mike himself will be suspended and the work

must go on with other people. I do not want ALCOR, either before or after Mike's suspension, to move into cult status, where members are expected to believe the leader's pronouncements on all sorts of issues only vaguely related to the organization's primary purposes. Mike's idea that it is somehow self-evident that nuclear weapons and handguns are somehow good things to have around (as opposed to "unpleasant, but currently necessary under some carefully limited circumstances," as I would say) is itself short-sighted, I think. It is his personal opinion, I hope, and should not be taken as specific ALCOR policy. ALCOR should have no policy on such matters, although it should have policies detailing how and when ALCOR employees or representatives possess and use firearms (or nuclear weapons) while they are acting as agents of ALCOR.

Mike writes that "the road to hell is paved with good intentions." He should remember that the road to "heaven" is **also** paved with good intentions. Good intentions are not suspect in themselves; they are required to start any worthwhile project. The difference is that the people who went to hell (or failed to achieve long term survival, in our case) were the ones who had good intentions and nothing else, the ones who thought that immoral means could be used to achieve a moral end. Perhaps Mike would prefer to substitute the word "effective" for "moral" in his particular analogy; but in the long run "moral" and "effective" may not be much different. When ALCOR starts to behave as badly as the opposition, how are we to choose between them?

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CONTINGENCIES FOR CRYONIC RESUSCITATION

by Mike Perry

It sometimes startles outsiders to hear us cryonicists say that we hope we are never frozen -- but nevertheless it is certainly true (dying and being frozen being, if not the worst, at least the **second worst** thing that can happen to you). Among the things we are most concerned about is loss of personality information, making it impossible to bring us back just as we were before suspension. This loss could be brought about by freezing damage to the brain (the main storehouse of personality information) or (and probably more importantly) brain damage prior to freezing. In extreme cases, the whole brain may be lost and it may be necessary to consider bringing back a person from tissue samples. (Several such cases exist today, in fact, and many, many more may be in the works, depending on how much information can be extracted from human tissues that survive in many places in varying states of preservation.) This raises interesting questions.

It seems reasonable that a brain-damaged individual, at the very least, should be restored with whatever faculties can be inferred from the DNA, together with whatever memories can be inferred from what is left of the brain. (This assumes no special directive from the individual indicating other than the wish to be revived, so far as possible, with all faculties intact and unaltered.) That way you might get a partial or total amnesiac, but there would be no physical impairment. The resuscitee in fact might not be very different from those recovering from a serious head injury today, with loss of memory, particularly around the time of the "accident" (in this case, deanimation), but (unlike many head-injury cases today) there would be a full recovery of intellectual, motor, and other mental and physical skills. But why not go further? A great deal of information about the person that had been lost from the brain might be inferable from outside sources, particularly when there had been severe damage or total loss, and when others were available who

remembered that person well. A lot might depend on the person's expressed wishes. Since many people do not leave much behind in the way of "expressed wishes," however, a lot would then depend on default assumptions made at the time of resuscitation. These could be very different from the default assumptions we would make today, however.

Indeed, our attitudes today are strongly colored by current medical technology and practice, even though we hope for a time when this limited capability will be far obsoleted and superseded. For example, today we might be inclined to restore a patient with only the information that could be inferred from the remains, much as we would do in the case of conventional illness or injury, having nothing better that we can do. In the future though, our powers to deal with a person on the basic level, as an information processing device, will be almost unimaginable. By analogy with our primitive computers of today, we can see that a person is made up of two basic components, "hardware" (the body, including the brain) and "software" (primarily, the memory information acquired by the brain in the course of living). The hardware should be reconstructible, to a satisfactory degree of fidelity, from the DNA that is replicated trillions of times over in the cells, so the hard part will be reconstructing or repairing the software. Although there is no way to restore software that is totally lost (short of a very unlikely, lucky guess) some powerful means may be possible to infer missing portions with reasonable certainty.



As an example, consider the case of a person who must be restored from tissue samples, whose brain is essentially lost, and whose "remains," other than cellular DNA, consist largely of others' recollections and written records. (Cases like this are known to cryonics today.) We could, for example, simulate various possible versions of this person on a supercomputer of the future. (By analogy, computers of today are often used to simulate other computers running with various programs.) The person's hardware would be inferable from the DNA, and various models of the software, or "person-programs" could be tried. Each of these would induce a certain behavior in the subject, and the objective would be to find a person-program whose behavior best fit the surviving information about that person. Many, many such programs could be tested in parallel, at enormous execution speeds, leading possibly to a quick convergence on software closely resembling the original. In this way it should be possible to obtain a person who would be indistinguishable from the original to those who knew him. Experiments could be done to see how close the expected resemblance to the original would be, and how the amount of difference would compare, say with that induced by disorders of today, such as aging or brain diseases. Philosophical and technical issues would have to be dealt with, such as how to characterize "person-programs" and measure "distances" between them. Ethical issues would have to be settled, such as how to answer the necessary questions and achieve the desired results without "creating" myriad new individuals who could then claim rights of survival. How these problems are resolved will in turn affect the default assumptions that are made about resuscitating cryonics patients, and how their directives, limited by the perspectives of their times, are interpreted.

In short, the future should be interesting. We want to survive to that future as intact as possible, but we can reasonably expect that the quality of our preservation will be uneven, as it already is for those in suspension. Given this fact of life, we want to make the most of our resuscitation, whatever the difficulties may be. The more information that survives about us, the better our chances will be for high-fidelity recovery. We should preserve information about ourselves, outside our memories. Possible ways of doing this include having good friends and keeping records. As usual there could be liabilities (confidential records can cause trouble if stolen, for instance). Attaining immortality will not be simple or easy, but will require dedication, good judgment and plenty of plain hard work.

* * * * *

NEURAL NETWORKS: GOOD NEWS FOR CRYONICISTS

by Hank Lederer

Today most digital computers are built using the sequential logic architecture first described by John von Neumann in 1945. These machines can be millions of times faster than humans when used to solve mathematical problems and accurately manipulate and store large masses of data. But even the best supercomputers cannot yet match the capabilities of a small child when it comes to recognizing spoken words or human faces. This is mainly because these computers handle one thing at a time while a human brain handles millions of things simultaneously.

Neural networks are based on a simplified version of the architecture of the brain and carry out many operations in parallel. These networks are made of lots of identical, simple, but highly interconnected processors. Each processor has many inputs and only one output. This output provides the inputs to many other processors, and so on. Each interconnection is continuously "weighted", depending on how often it is used. There are many ways to hook all this together and much work is being done to learn the best ways. These networks cannot be programmed; they must be

taught. They also adapt to changes in the nature of their input by learning new ways to handle it and, interestingly enough, they forget the old ways.



They are a complementary system to artificial intelligence (AI). The combination of the rules and logic of AI and neural networking systems will, I believe, bring about the first computer to equal the human brain in all measures of intelligence. It will also be much faster and should be less subject to emotions. (Will it be "conscious?")

This brings us to the first of the two items of good news this technology brings to cryonicists. That is the probability that computers are going to get a lot smarter very soon. The advanced technical AI required to enable the "Drexler Machine" breakthrough (artificial replicating assemblers) will most likely be available in ten years. This means that an estimated breakthrough date of 2007 (plus or minus ten years) should not be delayed by computer technology. (In the second issue of his Foresight Institute **Update**, published in the Fall of 1987, K. Eric Drexler indicated that a guess of ten to thirty years was reasonable, and since 20 years is the midpoint, I simply added it to 1987.)

As a cryonicist, I feel that the earlier the breakthrough the better. Many experts, including Eric Drexler himself, feel that if it comes too soon, our institutions will not be ready to handle it and we are in great danger of destroying ourselves. I don't expect our institutions to change enough in even sixty years to make destructive use of the enormous power of nanotechnology less likely. But the abrupt onset of nanotechnology, whenever it hits us, may shock us into changing our very way of thinking. I hope for this kind of mind set: "What the hell are we fighting about? Let's take time out to enjoy this new wealth and health! We can decide about whether we like our neighbor's faith or politics or complexions later." I am also concerned that we may destroy ourselves before we achieve nanotechnology.

The sooner advanced cell repair machines are perfected, the sooner we are able to be reanimated. The sooner we are able to be reanimated the better the odds are that we **will** be reanimated. Many adverse events could close Alcor; war, severe economic dislocations, anti-science social and/or religious movements, political changes, and so on. If you were to give Alcor a seventy percent chance of surviving for ten years, each additional ten years reduces its long term chances in this manner: 10 yrs. = 70%, 20 yrs. = 49%, 30 yrs. = 34%, 40 yrs. = 24%, 50 yrs. = 17%, and 100 yrs. = less than 3% probability of still being in existence.

The second reason neural networks are good news is due to a remarkable property they possess. The information in a neural network is not in any given location, but is diffused throughout the network or large portions of it. While this upsets some computer logic designers and makes the verification of the details of information transfer and storage rather difficult for network designers to determine, it makes the network extremely resistant to damage. You can destroy a substantial portion (20% for example) of a computer of this type and it will still function. It may be a bit slow and fuzzy for a while, but most of the basic information is still there and accessible and it relearns quickly. And since the neural network is modeled after brains, it means our brains are resistant to damage in the same way. Even if every third neuron in a person's brain was damaged beyond recall, that person should revive knowing who he or she is and have at least hazy recollections of life. This assumes a fairly random destruction of neurons, rather than concentrated destruction in one area.

Additional information in neural networks is available in an article in the February, 1988 issue of **Discover**. This is the one with the scare headline: "Cryonics: The Chilling Truth," so you might as well read it and learn the startling news that some cryobiologists think cryonics may not work. "Nerves of Silicon" (the neural network article) is well written and informative.

THE FUTURE OF MEDICINE

by Mike Darwin, with assistance
from Steve Harris, M.D.

What we hope we are especially good at as cryonicists is predicting the future -- particularly the future of medicine. After all, our lives depend upon it. Because that's what cryonics is about -- tomorrow's medicine today. In order for cryonics to seem reasonable, in order for it to be reasonable, it is necessary to have some idea, at least in broad outline, of where medicine is going and of where it ultimately can go. I think that the cryonicists' record on this point in a broad sense has been very good. Long before Drexler, Moravec, and others, cryonicists realized in broad (and often considerable) detail the ultimate capabilities of medicine: cell repair and molecular-level manipulation and reconstruction of biological systems.

I say here that our record has been pretty good even though these developments haven't happened yet, because others are now beginning to arrive at the same broad conclusions from different pathways (i.e., Drexler via an engineering, nonmedical pathway, and so on). The net effect of our "clear vision" as cryonicists has been broad agreement on the ultimate limits of medicine. Almost all cryonicists are generally agreed upon where we can go, if not whether or not we'll want what we can have when we get there. By this I mean that there are still likely to be tremendous debates about the personal utility of the ultimate end products of medicine, such as the ability to make and store software and or hardware duplicates of ourselves or to transfer our "identities" to other hardware systems. But these are debates that are already going on and will no doubt continue to go on right up until the time these technologies materialize. They are not what I have in mind to explore here.



One thing which is rarely seen in cryonics publications is an attempt to see the shape of things to come in the near or intermediate future. Oddly enough, that's a far more difficult and dangerous undertaking than predicting ultimates. Nor is this a problem confined to cryonics or the future of medicine. Sadè Carnot (the founder of thermodynamics) could tell you all about the "perfect heat engine", but would have no doubt had trouble giving you hard numbers on how well heat engines would be made to perform over the 20 years or so following publication of his work. The theoretical strength of steel is easy to predict -- and just as easy to be wrong about. Practical predictions are dangerous to make. But they are also exciting because they touch our lives more immediately and intimately.

Such predictions are invariably shaped by the predictor's world view. When I look over predictions made in the 1950's or the 1960's about the future of medicine and/or technology, I always chuckle about just how far afield these guys were. A good example is a list of predictions made by Herman Kahn which was summarized in CRYONICS REPORTS in August of 1967 (volume 2, #8) They are reproduced as Table 1 below. Read 'em and weep -- or laugh if you will!

* * *

Table 1. Less Likely But Important Possibilities, from: The Next 33 Years: A Framework For Speculation, by Herman Kahn and Anthony J. Weiner (1967)

"True" artificial intelligence
Practical use of sustained fusion to produce neutrons
Artificial growth of new limbs and organs
Room temperature superconductors
Major use of rockets for transportation (either terrestrial or extraterrestrial)
Effective chemical or biological treatment for most mental illnesses
Almost complete control of marginal changes of heredity
Suspended animation (for years or centuries)
Practical materials with nearly "theoretical limit" strengths
Conversion of mammals (humans?) to fluid breathers
Direct input into human memory banks
Direct augmentation of human mental capacity by the mechanical or electrical interconnection of the brain with a computer
Major rejuvenation and/or significant extension of vigor and lifespan -- say 100 to 150 years
Chemical or biological control of character or intelligence
Automated highways
Extensive use of moving sidewalks for local transportation
Substantial manned lunar or planetary installations
Electric power available for less than 0.3 mil/kw-hr
Verification of some extrasensory phenomena
Planetary engineering
Modification of the solar system
Practical laboratory conception and nurturing of animal (human?) fetuses
Production of a drug equivalent to Huxley's Soma
A technological equivalent of telepathy
Some direct control of individual thought processes

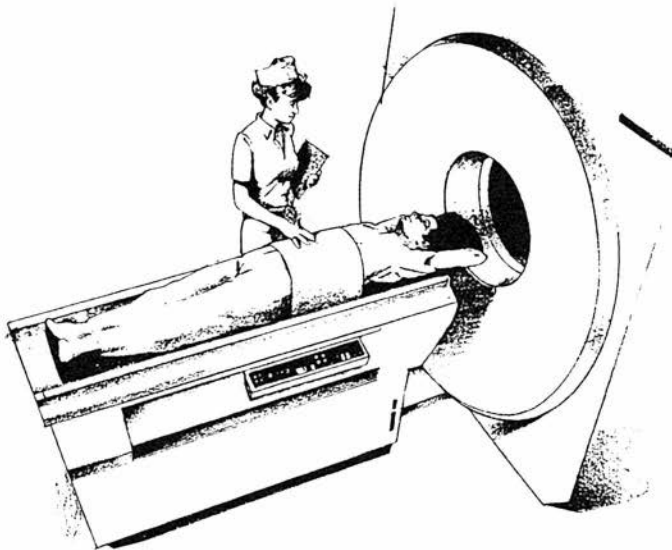
* * *

Since I'm not adverse to some risk-taking myself, I've decided to try my hand at the Cassandra game. My personal perspective is one of being a hard-core cryonicist

who was involved in clinical medicine for the better part of a decade. My biases about predicting the future could probably be summarized as follows: I have a lot of sympathy for the incrementalist view of progress -- particularly in the highly regulated area of medicine. It's regulated because it directly and powerfully touches people's well-being and because it is not a very fault-tolerant area -- mistakes are costly and since people like being alive (at least in the short run) they get edgy if an error separates them from their actuarial expectations.

I thus believe that any predictions about the future of medicine have to include what I call the "space program factor" (SPF). By this I mean simply that progress in the space program would have proceeded far, far faster (and thus approximated more closely what was theoretically possible) if it were not a high-visibility project with lots of political and social overtones which make it fault-intolerant -- if you could burn up as many astronauts as you do test pilots every month, it would cost a lot less to get where you're going. First-shot fail-safe engineering is costly. Medicine suffers from the same kinds of problems -- witness the FDA as both the solution and the problem.

With these biases articulated and in place I'll get down to brass tacks and launch into my predictions about both the general direction I see medicine headed in over the next 20 years, and some of the specifics I see on the horizon. Hopefully, I'll be around a couple of decades from now to chuckle over these predictions and (perhaps) ruefully file them alongside Mr. Kahn's.



DIAGNOSTICS

I foresee a veritable explosion of diagnostic techniques and procedures. A large number of illnesses which are poorly understood today will be well-characterized in the next decade and will be easy to diagnose very early in their development or even before they develop because they will be found to have direct or indirect genetic causes. Fairly predictive tests for Alzheimer's disease, schizophrenia, depression, some malignancies, heart disease, and most

of the rest of the major killers and disablers will probably be in place by 2000 to 2010. Many if not most of these ailments will be assessable in terms of a very sophisticated genetic risk profile which it will be possible to generate in infancy or childhood (or in utero). A wide range of genetic probes for illness-generating genes should be available by the end of the century. These methods will never be 100% effective, of course; we know from studies on identical twins that some fraction of the risk from the major killers is environmental. Nevertheless, sophisticated genetic analysis will allow those of us humans who want to (and that includes ALL

cryonicists) to see into our personal health futures at least "through a glass, darkly."

Real-time diagnosis will also be revolutionized by the turn of the century. The next 10 to 15 years will see increasing miniaturization of sensors and chemistry packages. Tissue probes or biosensors which can measure a wide array of biological and biochemical factors will be packaged in very small, very stable devices which hold calibration over prolonged periods of time (weeks to months to years) and which can easily be inserted into the patient's body or tissues. For example, I foresee multisensor units mounted on very small needle or catheter tips which can be inserted intravenously, intracranially, intracerebrally, subcutaneously, and so on. These sensors will be able to give real-time measurements of blood gases, pH, electrolytes, enzyme levels, and a host of other biochemical parameters that now involve costly, time-consuming, and/or impossible "laboratory studies" requiring withdrawal of a sample and processing. Real-time biosensors will revolutionize acute care of critically ill patients. Physicians will be able to intervene and correct metabolic and other imbalances long before a patient begins to suffer symptoms on a gross level.

Today, by the time a patient is experiencing an arrhythmia or electrolyte imbalance, a whole cascade of subtle changes has gone on at a level far beneath the ability of today's physician to appreciate. The first and simplest of these real-time sensors will probably be for blood gases and electrolytes, and will be marketed as catheter-tip devices which can be threaded into a vein or artery and used to monitor the status of critically ill Intensive Care Unit (ICU) and Cardiac Care Unit (CCU) patients. The first generation of these devices should be in the market place somewhere between 1990 and 1995. More sophisticated instruments capable of a wider array of measurements will quickly follow.

These sensors will also have a profound impact in acute stabilization of patients in a field setting. It will be possible for paramedical personnel to quickly and effectively insert such instruments in an acutely ill patient -- a victim of cardiac arrest or trauma, and immediately and globally assess that patient's condition, relaying that information to an expert (more on who that expert will be later).

A major area of advance here will not be just real-time measurement of things we already know the significance of measuring, but also of things we don't know the significance of measuring yet. A number of other biochemical markers for acute illness and disease will probably also be in use. Good candidates are measuring the levels of bioregulatory molecules and other biochemicals in the serum, such as amino acids. A whole host of regulatory molecules will probably be understood to be of significance in acute and chronic diagnosis. Thus, expect to see tests for measuring levels of a wide range of hormones and compounds you never heard of before. In a patient with cardiac injury for instance, you can expect to see real-time measurement of pH, blood gases, myocardial metabolites, or other critical bioregulatory compound levels as well as the more traditional EKG, respiration, and heart rate.

Existing diagnostic equipment which is considered very costly and not "real-time" should also become more available. Diagnostic imaging should rapidly come down to a battle between ultrasound and MRI (NMR; nuclear magnetic resonance imaging). Because ultrasound units owe their size and weight almost entirely to the computer that processes the information, the size and effectiveness of these units will change on the same rapid exponential curve as the size and power of computers. MRI is a technology which has some other physical limitations, but by the year 2000, even MRI

units will be far smaller, less costly, and capable of far, far better results. Bedside units or "on floor" units (i.e., units in the ICU or CCU) may be available for repeated assessment of the patient's condition. MRI and its grandchildren and cousins should in particular be expected to undergo considerable refinement. Metabolic MRI will also be in wider use, allowing for real-time evaluation of the metabolic and working state of patient's hearts, brains and other organs. By 2000 to 2010 the cost and size of these units may be drastically reduced and they may be in field use for acute metabolic and structural evaluation of patients with trauma or in cardiac arrest.

The ability to measure a wide variety of critically important metabolic and physiologic variables will open up as a possibility the ability to arrive at diagnosis of a patient's condition far, far faster than is even dreamed of today. The possibility of diagnosing faster will invariably raise the possibility of intervening faster and treating faster. The problem with utilizing the ability to measure a wider range of critical physiological and biochemical factors in real-time will be a tremendous increase in the need to make sense out of this information and arrive at a diagnosis of the patient in real-time. Telemetry of this information to a qualified physician is of course one possible answer to this problem. But it is not a very practical one. There are simply too many medical emergencies that require (and will be amenable to) prompt intervention on the basis of sophisticated real-time "laboratory" evaluation of the patient, to be handled by the available or foreseeably available pool of experts. Furthermore, the availability of continuous chemical sensing capabilities via inserted sensors will generate a flood of data which no human being, however qualified, will be able to handle without help.

By the late 1990's there should be an answer to this problem in the development of the Portable Doctor or Expert Medical Device (EMD). The EMD will be both a diagnostician and therapist integrated into one unit. In an emergency medical setting (either in an ambulance or in an ICU or CCU) this powerful computer will be directly coupled to a wide array of both simple and complex medical assessment devices. In an ambulance responding to a heart attack victim the EMD system would function as follows:

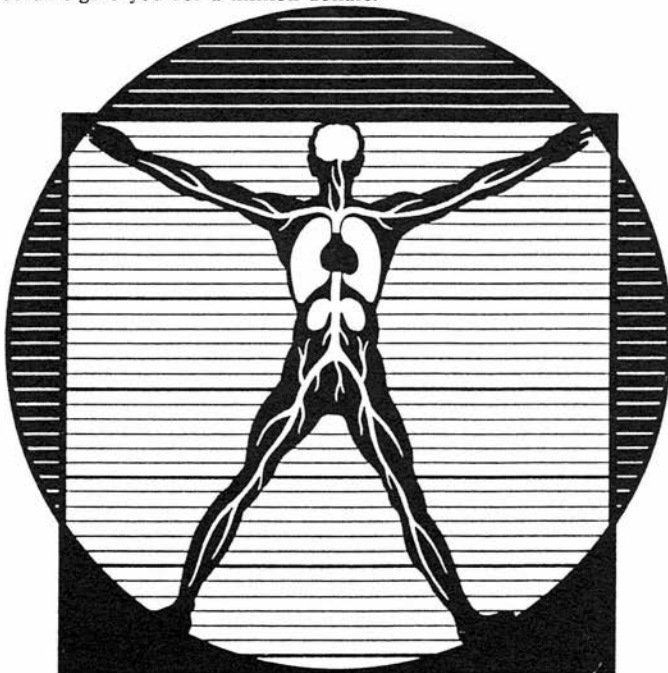
The paramedics arrive and the patient is found on the floor in apparent cardiac arrest. External and then very quickly, open chest CPR will be started and the patient will be quickly instrumented: automatic ultrasonic doppler blood pressure cuff (virtually identical to the Dinamap automated blood pressure monitor in use today except weighing a few ounces instead of a few pounds), biosensor for pH, blood gases, and other critical variables (including blood electrolyte and cardiac and cerebral resuscitation medication levels), combination EKG electrodes and defibrillator paddles, and so on. Within several minutes the EMD will be quietly verbalizing a diagnosis and treatment protocol to the paramedical staff. Medications will be given per the protocol the EMD calls out and the EMD will directly handle defibrillation based on the patient's EKG and blood biochemistry.

EMDs will be a very hot item. Initially (i.e., the 1990's) they will be confined to ambulances and the ICU, CCU, and specialty areas of the hospital, such as radiology and cardiology labs. But there will be powerful incentives for wider application of these devices. As computing capacity drops in cost and increases radically in sophistication (i.e., parallel processors, neural networks, truly massive memories, and so on) expert medical (and other) systems will see increasing application. There will be devices on the market such as a "Home Doctor" diagnostic program, which will basically be an internal medicine physician in a can. Increasingly (late 1990's) a wide array of attachments will be available to expand

the diagnostic range of the device. Initial capabilities will be a reasonably complete clinical chemistry evaluation from a drop of blood from a finger prick and evaluation of blood pressure, chest sounds, and EKG. These devices will be initially used on a wide scale in 3rd world countries and in military applications where medical know-how is simply unavailable. Use will expand to shipboard situations and finally to home use. Rapid reduction in price of devices such as ultrasound and MRI scanners after 2000 may allow for these devices to be available in the home or, more probably, at shopping malls or other easily accessible areas.

After 2000, many people will probably have a small sensor array permanently implanted and coupled to telemetry equipment which can be activated to call for help or alert the person that trouble is brewing. People with a known risk of sudden health problems will be the first to use these kinds of devices. With the development of smaller and cheaper telemetry equipment (directly linked to large-antenna satellites), separate telemetry arrangements will disappear. Implantable, computer-controlled defibrillators are already a reality; analogous devices to deliver drugs in case of cardiac or brain infarct (stroke) will eventually become reality.

The point here is that medical care via expert systems should become radically more available. Instead of getting your blood pressure checked by a machine at the shopping mall you will be able to have a complete and thorough exam, including a total body NMR scan with 1mm or less resolution. The Doc-In-A-Box will then refer the patient for specific therapeutic modalities such as specific medications and/or surgery. People will use such services both prophylactically and when they are just not feeling well. Thus, if you have a chest pain, you can link up with Home Doctor over your PC net or perhaps use a small device in your home on the shelf. If it looks at all serious, you may stroll into a neighborhood Urgent Care Center (Doc-In-A-Box) and receive the kind of diagnosis and treatment in real-time that today's cardiologists couldn't give you for a million dollars.





RESUSCITATION:

Expect a shift back to open-chest heart massage and away from closed-chest massage in medical and perhaps even paramedical settings. Closed-chest CPR will be realized to be ineffective at maintaining cerebral viability and will be replaced by far more effective open chest methods. In paramedical (i.e., field) settings the emphasis will be on very rapid defibrillation -- or actually "leaving the patient alone" until circulation can be effectively restored and medications given to inhibit reperfusion injury. Closed chest CPR and restarting circulation by laymen "in the field" will be realized to be doing more harm than good and there may well be a move away from field CPR, with laymen being instructed to leave the patient without circulation until it can be restarted adequately and under controlled conditions.

By the late 1990's, extended use of CPR will be a thing of the past and major metropolitan areas will have "death reversal units" (DRUs) in emergency rooms and perhaps even in larger paramedical units. The DRUs will employ rapid femoral cut-downs and blood-pump/oxygenator supported resuscitation to recover people who have suffered extended periods of ischemia (in the 30 minute to 1 hour range). CPR will be realized very often to be ineffective at recovering patients who are profoundly ischemic and the advent of pharmacologic intervention allowing for cerebral resuscitation will provide tremendous pressure for emergency rooms to develop the capability to very rapidly put an ischemic patient on bypass and completely and adequately support his circulatory and respiratory needs until his brain can recover and/or his heart can be repaired and restarted. An intermediate scenario would be the development of small, flexible impeller pumps that can be collapsed and passed through a large bore percutaneous catheter through the femoral artery and into the abdominal aorta. Such a pump (acting much like the propeller on an outboard boat motor) could then be used to supplement CPR, perhaps providing 2-3 liters per minute of cardiac output.

Cerebral resuscitation and ischemic therapy will undergo a gradual but tremendous advance over the next two decades. A variety of drugs and therapeutic modalities will be introduced which will allow for treatment of ischemic injury. The first to benefit from this therapy will be the heart. The use of free radical scavengers such as superoxide dismutase coupled with other drugs such as calcium channel blockers will be used to routinely recover seriously ischemically injured heart tissue even after six to eight hours of no blood flow. A patient with a heart attack will be given Bioregulatory Molecules (BM's) such as TPA to dissolve clots and will then be treated with drugs to inhibit reperfusion injury to the tissue and thus block ischemic cell loss. Widespread first phase application of this technology can be expected by 1989 to 1992. Soon thereafter it will be realized that even patients with massive infarcts can be saved if only they can be supported long enough for their hearts to recover. Thus, expect to see patients with massive myocardial infarctions supported by blood pump and oxygenator while they are treated for cardiac ischemic injury.

Drugs such as the **lazaroids** (powerful synthetic free radical scavengers which cross the blood-brain barrier and greatly reduce tissue reperfusion injury), second and third generation calcium channel blockers, and NMDA receptor inhibitors (to inhibit ischemia-induced seizures which result from neurotransmitter release during and after the ischemic episode) will be increasingly used to facilitate the development of a brand new area of medicine: cerebral resuscitation. Patients with prolonged periods of cerebral ischemia up to and including one hour of no blood flow to the brain at normal body temperature will be increasingly recovered. Patients will be initially treated with CPR and stabilizing medications and then quickly coupled to extracorporeal support using membrane oxygenators (ECMO) for prolonged support during cerebral and cardiac recovery. Expect widespread application of pharmacologic intervention in cerebral ischemia by the early to mid 1990's and more sophisticated maneuvers such as ECMO by the mid to late 1990's.

Another effect of drugs like the **lazaroids** and calcium channel blockers will be the more effective treatment of acute injuries to a wide range of tissues such as the spinal cord and brain. Much of the damage that occurs to these tissues is free radical related and can be inhibited by use of these drugs. Also expect the deployment and development of a growing array of bioregulatory molecules to inhibit post-trauma tissue injury. The next decade will see rapid expansion of our understanding of the biochemical cascade of events which underlie tissue injury. The result will be a growing family of drugs which mediate or block inappropriate inflammatory and/or immune responses to injury. No more "sprained" ankles, or at least no more massive swelling and "secondary" injury from the primary traumatic event.

Not only may secondary disease effects be controlled on a local basis, but also on a systemic basis. The general malaise which accompanies systemic infections rarely has its basis in direct infection of the brain by microbes. Rather, it is usually a result of specific molecules released by the immune system which are picked up by brain receptors. The blood levels of these molecules will be susceptible to measurement (providing your Doc-in-a-can with good information); and the receptors for them will be susceptible to blockade with appropriate pharmaceuticals. In the future, then, while you are waiting for high potency antiviral drugs and immunostimulators to deal with your flu, you will be able to take a pill which makes you feel better immediately. And, in order to warn yourself if things get a lot worse, you can watch a read-out which will tell you how bad you should be feeling.

Intervention into secondary inflammation will be most important in the brain and

spinal cord. Deployment of these techniques will result in the salvage of many spinal cords that would be considered irreversibly injured by today's medicine. There will be far, far fewer paraplegics. However, expect an increase in the number of permanently brain-injured patients and in the number of patients with "subtle" forms of cerebral injury resembling mild stroke or the cognitive or mood disorders seen in diseases like multiple sclerosis or acute head injury. These disease states will result because people with brain trauma who would have died acutely from secondary free radical mediated injury (cerebral edema and so on) will be saved with Lazaroids and other cerebral rescue techniques. While these techniques will be effective at preventing post-traumatic reactive injury and progression to brain death, they will not stop some cell loss in the acute area of injury. Expect many such people to have subtle (or not so subtle) neurological defects ranging from quite sharp cuts in a given ability (such as music, mathematical reasoning...) to more subtle changes in mentation such as emotional lability and mood changes.

Medicine will probably be very slow to treat these kinds of things. They will require brain grafts and/or local regeneration of brain tissue, and it seems unlikely that such medical know-how will be available on a widespread basis until well after the year 2000. However, regeneration of tissues with naturally dividing cells (skin, bone marrow, etc.) will be routinely stimulated with a wide variety of artificially produced natural growth factors and their analogues. It is known that the saliva of many animals contains an epidermal growth factor which stimulates the healing of licked wounds. This factor and others related to it have now been cloned, and should appear in medicinal salves within a few years. Over the next two decades, look for similar stimulators to be applied to virtually every kind of tissue trauma.



ANTIBIOTICS

The next twenty years should see many powerful new antibiotics engineered directly from knowledge of the structure of the relevant microbial enzyme which it is desired to inhibit. Not only will these antibiotics be more powerful, but because they do not exist in nature, strain resistance will not so easily develop toward them as it has for the antibiotics of today. In addition, the next generation of antibiotics will include many which have been designed for effect against viruses, an area where medicine is presently largely powerless.

IMMUNOLOGY AND CANCER

By the mid to late 1990's there will have been profound advances in immunology which will be being translated into a wide range of increasing medical capabilities. Tissue rejection will be amenable to treatment in almost all cases by highly selective destruction or inhibition of certain parts of the immune system without the negative consequences of today's immunosuppressive drugs. Monoclonal and synthetic

antibodies carrying toxins or regulatory molecules will be used to turn off or destroy the fraction of immune cells which initially respond and proliferate when a transplant is carried out. More widespread transplantation of tissues will be undertaken, including transplantation of limbs and scalp. Xenografts will be used increasingly in the mid to late 1990's and it will not be uncommon for people to have pancreatic tissue from bovine or porcine sources and perhaps hearts, lungs, and livers from other animals. Expect the first workable transplants to be from great apes (chimps, gorillas, orangutans), with porcine and bovine grafts coming later.

Immunology and immunotherapy will also be revolutionized by a far more complete understanding of the immune system resulting from the AIDS epidemic and basic research in the immunology of diseases such as multiple sclerosis and aging. The ability to rapidly and cheaply synthesize bioregulatory molecules will open up a wide array of therapeutic possibilities. Expect effective treatments for most autoimmune diseases (lupus, multiple sclerosis, myasthenia gravis, and so on) by the mid to late 1990's. The mid to late 1990's should also see the wider application of immunorestoratives for use with the aged and ill. Cancer therapy will improve considerably as a result of these advances as well as a result of selective targeting techniques. By the early to mid-1990's the first generations of monoclonal antibodies linked to chemotherapeutic agents or powerful natural toxins will be used against a few cancers.

These drugs will work by making use of an antigen or receptor present on a given cancer cell type which is not present on normal cells. An antibody or binding site to this receptor or antigen will be made and a toxin attached to it such as ricin or a traditional chemotherapeutic agent such as doxorubicin. The antibody or receptor molecule will carry the toxin directly to the malignant cells and kill them. Deployment of this technology will proceed somewhat slowly at first and it will probably not be fully developed until other more sophisticated modalities of therapy which strike at the basic mechanism of the disease are available and in use around 2000 or slightly thereafter.

Basic therapy for some forms of cancer in the form of introducing or inhibiting genes responsible for malignant proliferation may be tried in the mid to late 1990's. Good candidates for this are pediatric malignancies such as retinoblastoma and Wilm's tumor of the kidney.

ATHEROSCLEROSIS

Atherosclerosis will undergo a very marked but nevertheless gradual reduction in frequency and severity of occurrence as physicians slowly become educated about what is already known and begin to use existing therapeutic modalities more aggressively. By the mid to late 1990's it will be more widely understood that atherosclerosis can be reversed, and there will be wider use of drugs such as lovastatin to reduce serum cholesterol, coupled with sound dietary advice. However, even well into the late 1990's and perhaps beyond, atherosclerotic disease (heart attack, stroke, ischemic limb disease, and so on) will continue to be a serious source of morbidity and mortality. By the late 1990's, 2nd and 3rd generation therapies will be coming on-line which will be able to reverse atherosclerotic disease and more directly inhibit it. Bioregulatory compounds capable of blocking either foam cell proliferation in newly forming arteriosclerotic plaques or some other basic biochemical event in atherosclerosis will be coming on-line.

END OF PART I

Meeting Schedules

Alcor business meetings are usually held on the first Sunday of the month. Guests are welcome. Unless otherwise noted, meetings start at 1 PM. For meeting directions, or if you get lost, call Alcor at (714) 736-1703 and page the technician on call.

ALCOR

The MARCH meeting will be held at the home of:

(SUNDAY, 6 MAR 1988) Marcelon Johnson
8081 Yorktown
Huntington Beach, CA

The APRIL meeting will be held at the home of:

(SUNDAY, 10 APR 1988) Virginia Jacobs
29224 Indian Valley Road
Palos Verdes, CA

* * *

The Alcor Cryonics Supper Club is an informal dinner get-together. These meetings are for newcomers and old-timers alike -- just an opportunity to get together and talk over what's happening in cryonics -- and the world!

If you've wanted an opportunity to ask lots of questions about cryonics, or if you just want a chance to spend some time with some interesting and nice people, pick a date and come! All dinners are scheduled for Sundays at 6:00PM.

SUNDAY, MARCH 20

Good Earth Restaurant*
10880 Wayburn
Westwood
(213) 208-1441

* Please note that Wayburn is right off Wilshire in Westwood. There are two Good Earth's within blocks of each other. One is on Wilshire and the other is on Weyburn. We will be dining at the Weyburn restaurant.

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