

# CRYONICS

MAY 1983

ISSUE # 34

## Contents:

Editorial Matters.....	page 1
Cryonics News Briefs.....	page 1
A Word About the Tahoe Festival.....	page 2
Letter to the Editors.....	page 3
Medical Care and Cryonics.....	page 6
Cryonics Science Reports.....	page 12
Book Review.....	page 16
Poem.....	page 18

CRYONICS is the newsletter of the Alcor Life Extension Foundation, Inc. Michael Darwin (Federowicz) and Stephen Bridge, Editors. Published monthly. Individual subscriptions: \$15.00 per year in the U.S., Canada, and Mexico; \$30.00 per year all others. Group rates available upon request. Please address all editorial correspondence to Alcor, 4030 North Palm #304, Fullerton, CA 92635 or phone (714) 738-5569.

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EDITORIAL MATTERS

We are pleased to announce that after several months of hard work, the third edition of "the blue book", CRYONICS: THRESHOLD TO THE FUTURE, is finished. We feel that the text of the third edition represents a substantial improvement over previous editions. We strongly urge cryonicists to consider ordering a few copies of the blue book to share with friends or to use as a tool for answering questions people frequently ask about cryonics. Some of the questions answered in the blue book are: "What does cryonic suspension consist of? How much damage is done by current freezing techniques? Why shouldn't I depend on the development of life-extending gerontological drugs or techniques? How can I afford the cost of cryonic suspension? How can I get involved?" We feel the blue book is the best available single piece of literature for answering people's questions about cryonics, and we believe that it can serve as a valuable back-up and reference source for interested people after having met with and talked to a cryonicist. If you haven't seen a copy of the blue book yourself, well, now's the time to order one. They are available from Alcor for \$1.00 each. We would encourage you to consider purchasing a copy or two to place in your local Public Library's "pamphlet file." This is an excellent way to get the word out to the public at a minimum cost.

In the next few months we hope to produce a two or three page companion photo brochure to illustrate Alcor's facilities and capabilities. Anyone with photographic skills or previous experience in this area could be of great help to us. If you think you might have some expertise or advice we can use, please give us call!

RECENT CONTRIBUTIONS: MORE OUTSTANDING SUPPORT

We'd like to take a little space to express our gratitude to some people who really deserve it. First of all, to Allen Lopp for his contribution to Alcor of \$1,000 to help support Alcor patient care operations. This was a very generous and decent thing for Allen to do, and all of the directors of Alcor wish to thank him. There is no easy way to show our appreciation for such generosity. We shall work hard to justify this show of confidence and strive to repay such generosity with the ultimate coin: success at our endeavors.

Secondly, we'd like to thank Maureen Genteman for her generous contribution of a year's funding for the Alcor paging unit which the rescue technician on-call carries around. This is the kind of day-to-day support that keeps Alcor running and allows us to continue to deliver high quality services at a reasonable price. Our thanks also to Fred and Linda Chamberlain and Paul Genteman for support of the neuropatient repackaging program. Thanks to these people and a few others, Alcor was able to purchase eight heavy-walled aluminum cannisters for repackaging the three patients now in the Alcor Cephalarium and provide for the ready availability of a "standard" cannister for additional neuropatients in the future. Once again, our sincere thanks to all of you.

ANOTHER UNFUNDED PATIENT: A REQUEST FOR HELP

We have received word that Trans Time and BACS are now faced with the prospect of removing another whole-body patient from suspension whose relatives have not provided funds for continued maintenance. . It is not appropriate to discuss details of this case, but we understand that unless funding of some sort becomes available this patient will be removed from suspension within a

very short period of time. If you think you might be able to help in some way, we urge you to contact Trans Time immediately:

Trans Time, Inc.  
1122 Spruce Street  
Berkeley, California 94707  
(415) 525-7114

#### A WORD ABOUT THE TAHOE LIFE EXTENSION FESTIVAL

Two years ago I had one of the most exciting and pleasant social experiences of my life: the Tahoe Life Extension Festival hosted by Fred and Linda Chamberlain. Shortly after that experience I was accused of too much hyperbole in describing it in the pages of this magazine. Several people who were not there told me I was merely caught up in the warm flush of excitement at experiencing four solid days of other cryonicists. The passage of two years has only confirmed in me the sentiments I felt when I wrote that first, glowing review: the Festival is great; it's where it's at; and if you're not there, then you're really missing something special. I think all of us in cryonics know by now that we are pretty much alone. It must be especially hard on those people who's only contact with other cryonicists or cryonics thought and philosophy is through the pages of this magazine. It is those people, the people who are really isolated that I wish to recommend the Tahoe Festival to. If it were only possible for me tell you what it will be like! Leave aside the towering pines, the rushing clear water, the emerald lake and you still have an incredible experience: the people. The emotional intensity and comraderie at the last Festival were incredible. I hope that no matter how big we grow or how important we become over the years, we never lose that incredible sense of community that showed through so strong two years ago. To those of you who are isolated by distance or other commitments Tahoe is an opportunity to experience cryonics in a way you never dreamed possible. If you come, I promise you, you will not be alone. Everyone is anxious to talk, indeed, hungry to talk about cryonics. If you want to learn something about hard-core passion to survive, then come to Tahoe; there'll be almost nothing there but people in a "frenzy" to share ideas. After all, most of the people there haven't had anyone to really talk to about cryonics either.

If it's technical, financial or personal advice you want, you won't find a bigger gathering of cryonics or life-extension experts anywhere. And since our absolute numbers are small, there is every opportunity to walk right up to someone and strike up a conversation. I think I can say without reservation that almost all the "experts" in cryonics are friendly, decent people, willing to talk and share their knowledge freely; not one's to stand on ceremony. If it's information you want even if it's just in the nature of a "better feel" for what cryonics is all about; then come to Tahoe: I guarantee you'll get it.

Finally, if you just want to get away from it all, to take a little time to realize just how gorgeous it is to be alive, then by all means come to Tahoe. The people who live up there at the top of the world call it Paradise. A single visit and I think you'll agree. By the way, if you're wondering who to talk to up there and you don't know any other cryonicists, just walk up and say hello, I for one will be happy to change that situation. I know I speak for an awful lot of other people who feel the same way. Come to Tahoe!

Mike Darwin

LETTER TO THE EDITORS

Dear Sirs,

I would like to raise a few points about articles in your issue dated April, 1983. This is not to say that I would have preferred not to have seen these articles, merely that I would like to state an opposing point of view.

In the article on Clarence Herbert, who died following a hernia operation, what was left out was the fact that had he not had the operation, he would still probably be very much alive. In The Complete Book of Longevity Rita Aero pointed out that when there was a strike of surgeons, the death rate went down. Obviously it is not scientifically valid to pontificate on a particular case without knowing all the facts. However, I do feel strongly that surgery and invasive diagnosis should be avoided at all costs except certain death. I think that there may still be a case for avoiding it in the latter eventuality if the individual is already old and has arrangements for cryonic suspension. Whilst I would respect people's views otherwise as far as their own cases are concerned, I would be very hostile myself if I was in a position whereby such treatment were forced upon me. Fortunately, the trend in medical technology is towards "gentle cures" and external diagnosis. However, I think that many members of the public may be far too acquiescent of what is done to them by the medical profession, and unaware of what may be possible in other hospitals or even other countries.

The idea that if it hurts or tastes nasty then it is good for you is a dangerous fallacy that is doing a lot of harm at present. The gut reaction avoidance of injury has been brutally suppressed by civilization up to now. Maybe if we don't suppress it and instead use it to our advantage, we may live longer both as individuals and as a species. I recommend Psychological Immortality by Gerry Gilles in this connection. I hope that if World War Three is shown on television in your area, you and your readers watch it.

In the same vein, (no pun intended) I feel that in some cases the angiography recommended on page 10 of your April issue may hasten the patient's demise.

One of the main causes of modern disease is stress and the only adequate and permanent cure is its removal, not its increase. I expect with conventional medicine many people recover despite treatment.

If medical examinations were required "or else" as was suggested, it may well be that yet more people would be put off the idea of cryonics. It is all very well for those with cooperative physicians, or the ability to make uncooperative ones help, but the average prospective cryonicist wants to have the least embarrassment with his new-found beliefs. They are fragile and should be nurtured, not put through a battery of obstacles like some Nazi initiation test. Immortalists must not see themselves as some sort of macho-master race. Apart from general distaste amongst possible members, the rest of humanity won't stand for another bout of that sort of thing.

It was proposed that if a person refused arranging medical examinations, he would be charged a fixed sum of \$10,000 plus \$120 per year, because it would cost \$10,000 plus his suspension arrangement fund to suspend him, if he died immediately upon joining. Surely, the simple answer would be for cryonics organizations who are concerned about this to raise the suspension fund requirement by \$10,000 and be done with it? We are talking about \$50-\$100 thousand, so there is no great problem with raising it another ten. This way there is less



bullying and high-handed demands placed on applicants.  
More tolerance and less megalomania, please!

Sincerely,  
John deRivas  
Cornwall, England

Dear Mr. deRivas,

We did not discuss the risks vs. benefits of elective surgical procedures in our article about Clarence Herbert because it was not relevant to the central issue at hand. We reported on the Herbert case because it represents a significant legal precedent of importance to cryonicists both in California and the United States at large. Had we wished to write an article about the proper direction or lack thereof of modern medicine, a discussion of Mr. Herbert's case from the vantage you suggest would have been appropriate.

Since you raise the issue of the appropriateness of elective surgical procedures and invasive diagnosis we would like to say a few words voicing a difference of opinion at least in degree if not in kind. It would be foolish to advise anyone to undergo a procedure which involves risk of death or serious injury without carefully considering alternatives and trying to "make the best" of the situation as it is. Unfortunately, this is not always possible. I would judge from the tone of your letter that you are young, in good health, and unfamiliar with hospitals, or medicine on an intimate basis. I say this because you seem to have little sensitivity to the fact that many conditions which, while not in themselves immediately life threatening, can make life miserable, even "unbearable." A bad case of hemorrhoids may not kill you, but at its worst it can make you wish you were dead! More seriously, conditions such as coronary and carotid artery disease can almost completely destroy the quality of life for people, making an operative procedure with a 3% to 10% chance of mortality look attractive. It has been my own experience that most people are concerned about the pain, potential for long-standing disability and lost productivity that attend surgical procedures—even minor ones. The deep, instinctive avoidance of injury operates well in most people, and it is usually only after they have been worn down by an illness that most people will consent to a surgical procedure. There is no way to explain the kind of transformation I see on a regular basis when a patient who was formerly so weak and angina-ridden that he could not even brush his teeth walks vigorously out of the hospital after a coronary artery bypass operation. Such procedures may extend life only modestly (when the surgical risks are averaged in) but for many they are the difference between a life worth living and life devoid of joy. Your statement that "surgery and invasive diagnosis should be avoided at all costs except certain death" is too extreme. It does not adequately reflect most people's values.

Not wishing to belabor the matter, I still feel compelled to point out that a hernia, while a seemingly minor thing to you, may not be so to someone who has one. Keep in mind that even with a brace or truss, a large fraction of hernias continue to extend, greatly increasing the risk of a strangulated bowel. A surgeon may counsel a patient to have surgery early on while the patient is stable rather than try to resect a gangrenous bowel in a patient who is twenty years older and possessed of less reserve capacity due to aging. Of course, all of this neglects the discomfort, embarrassment, and expense (the appliances are costly) of walking around all day long with one's genitals wrapped up in elastic. Consider also that in younger patients such non-invasive strategies for dealing with hernias result in elevated testicular temperature which in turn markedly increases the risk of death from testicular cancer. I point all of

this out to demonstrate that these issues are complex ones, often not amenable to sweeping generalizations such as the one you have made. If you are fortunate to live long enough, you may be unfortunate enough to have a taste of personal experience in such matters. You might be amazed at how attractive a cataract operation looks if you are blind, or how delightful the prospect of being able to climb a flight of stairs may look if you have diseased coronary arteries. In any event, I think we are both agreed that if possible we would like medicine to have progressed to the point where none of those things is necessary by the time we are old enough to need them.

As to your comments on suspension membership fees it should be stated at the outset that Dr. Donaldson's work represents merely the most preliminary of efforts. He has done a fine job of defining the problem in objective terms and he is to be commended for his efforts. No doubt many modifications will be made before any such plan is pressed into service. Certainly more than a few of the people here have expressed disagreement, sometimes heated, over Dr. Donaldson's plan. No one however has compared us to being Nazis—until now.

Why you should feel this way leaves me bemused and puzzled. First of all, the issue of a physical examination shouldn't really be such a major one. The vast majority of applicants for suspension membership will be funding their arrangements via life insurance. As you may already know, the purchase of any significant amount of life insurance, at least in the U.S., requires a physical of some sort. This arrangement is accepted with aplomb by most people, and presumably the cryonics organization would be willing to accept an insurance physical. Also, many other possibilities exist, as you yourself point out. Nothing being suggested now will be put into practice without much careful debate and feedback from members. The point is, there is an injustice in the current dues system and this injustice needs to be dealt with over the long run, or the most valuable people will have an incentive not to join us. What we need now is assets, not liabilities.

As to your comment about immortalists posturing themselves as some sort of macho-master race—well, one of the first things you learn, as Curtis Henderson, a pioneer cryonicist, told me many years ago, when you get involved in cryonics it changes everything. The rest of the world suddenly becomes "them" and we're "us." If looking out for your own interests constitutes a macho-master race attitude, then I guess we're guilty as charged. I think however, that the next time you sit down in front of your computer to dash off a letter, or turn on your television, or enjoy a meal of fine quality in a pleasant setting you should think about all the "subhumans" you have condemned to death through starvation and want because of your "insistence" or "expectation" that your life should proceed in "luxury." Since we are content to let three quarters of the globe languish in poverty with no hope for even a "normal" life expectancy while we exercise the ultimate conceit of wanting to live forever, I think we are all in a poor position to be casting aspersions about Nazism. As to the rest of humanity "not tolerating another bout of that sort of thing," from all I can see not only is humanity tolerating it, in many instances people seem to be digging in for seconds with real relish. You would have to live in a cave not to know about Uganda, or Cambodia, or South Africa. In the few decades since the last wave of such activity, things seem to have changed little. In the macho-master race business it is still "them" and "us" as usual. Maybe even immortality won't change that. Until and/or if it does, we would all do well not to cry "Murder!" when our own hands are dripping in blood. —MD

MEDICAL CARE AND CRYONICS: WHEN ENOUGH IS ENOUGH

by Michael Darwin

Cryonicists are by their very nature people who regard medicine highly. Most active cryonicists seek medical attention promptly and have very favorable attitudes toward medicine and medical care. However, an article on the special risks which medical care presents to cryonicists is long overdue. The action you take after reading this article may turn out to be just as important as paying your life insurance premiums.

## BACKGROUND

Medicine has undergone explosive growth in the last four decades. The development and widespread application of antibiotics has opened up a variety of surgical and technical procedures which were unthinkable before the 1940's: open heart surgery, transplantation, immunosuppression, and kidney dialysis. Improved public health, a high standard of living, and rapid advances in the drug and medical device industries have greatly extended the mean lifespan of western man. This blessing is not without its price tag. While more people are living longer, they are also surviving longer in a compromised or "nonviable" condition--unable to ambulate or care for themselves as independent human beings. The proliferation of nursing homes and intermediate care facilities is a grim testimonial to the price we are paying both as individuals and as a society for our conquest of infectious disease.

As more people live long enough to become aged, we have learned to treat certain symptoms of the aging process, although the underlying mechanism of aging remains untouched. Good examples of this kind of therapy include coronary artery bypass, femoral popliteal bypass (in the legs), and kidney dialysis. Unfortunately, these treatments not only do not work for long, they are very, very expensive. The average bypass surgery for coronary disease costs in the vicinity of \$50,000 per patient. Hemodialysis treatment is currently costing \$30,000 per year per patient, not counting lab work, X-rays, nursing home care, or the frequent hospitalizations required to support many of these patients. Indeed, the lifespan of the average dialysis patient is only five years. For diabetic dialysis patients the mean life span is about 1½ to 2 years.

Many patients who are clearly terminal due to advanced atherosclerosis and multisystem failure may be given additional life of a few months or years by the application of a number of these radical and expensive therapies which treat symptoms rather than underlying causes. In any large metropolitan American hospital, you may see many elderly patients receiving hyperalimentation (total intravenous nutrition), dialysis, and vascular surgery to save limbs in danger of being lost from atherosclerosis. Indeed, it is not uncommon to see blind, multi-amputee diabetics who are over 60 years old receiving hyperalimentation, dialysis, and vascular surgery. These patients invariably require complex and expensive support treatment. At the time of this writing I am caring for five patients who meet or exceed the list of debilities I have just described.

Most of them have chronic fevers and infections which require frequent and costly lab tests and multiple series of potent and expensive antibiotics. One patient I care for has been comatose for 2½ months in ICU, is 65 years old, has fulminating hepatitis, cerebral trichinosis (from pork ingestion), permanent renal failure from diabetes, and a systemic and pulmonary infection caused by several antibiotic-resistant organisms. In her 2½ month hospital stay she has already accumulated over a quarter of a million dollars of hospital bills.

Obviously it is only due to the existence of the Medicare/Medicaid racket that such a monstrous distortion of medical care could exist. When the physicians who are caring for these people are confronted with the ethics of what they are doing, most respond that it would be unethical not to apply such treatments. Their jobs as physicians, they claim, is to try and extend life with every available means, not to make value judgements about the quality of life they prolong. They feel that as long as the resources are available, they are morally bound to exploit them in the interest of prolonging their patients' lives. After all, they point out, some patients considered hopeless do sometimes surprisingly rally and make it. It is not their job as physicians to apply cost-benefit ratios where human life is involved.

The stupidity of this position and the evil which the Medicare/Medicaid system has generated would fill a text book. It is not necessary to elaborate further here. The above background is necessary, however, for you to understand that rationality is not likely to be a strong part of your physician's make-up, and that guilt and greed are two strong motivators for him to continue treating you, whether or not it is in your best interests as a cryonicist or even as a human being. While you may feel secure that your own physician would not act this way, it is wise to keep in mind that he will probably arrange things so he never has to make the decision. If you become seriously ill with ANYTHING, you will be referred to a specialist. If your heart goes, you'll get a cardiologist. If your heart isn't knocking out enough blood to keep your kidneys functioning, you'll get a nephrologist who'll put you on dialysis. Your nephrologist and cardiologist may consult with a thoracic surgeon and so on and so on. While you may be getting the best of care from each of these doctors individually, you may be getting the worst of care from them as a group. Groups of consulting specialists like this do not coordinate well in making "big picture" decisions. It has been my experience in many institutions that everyone goes along until the patient and medical staff are at wit's end. The nightmares produced in this fashion would simply be too incredible to be believed if they were shot as a documentary. Routinely produced medical horror stories from this kind of care would be more believable in the setting of Dauchau or Treblinka than in Dallas or Toledo where they are actually occurring.

#### PRACTICAL IMPLICATIONS FOR CRYONICISTS

Nobody wants to suffer the agonies of dying any longer than they absolutely have to. The ultimate horror is to suffer such



agonies while on a respirator with arterial lines, bladder catheters, and any other invasive device imaginable stuck into you--while conscious! It is the exception rather than the rule to see a patient die without these kinds of support. Discomfort is a real consideration in dying. What good are a few extra days or weeks in that kind of condition and with the added insult of that kind of expense? Clearly this is something we all wish to avoid, cryonicists and non-cryonicists alike. Unfortunately, it is not an easy thing to avoid. The law states that unless you have clearly stated the limits and restrictions you want placed on your medical care while you are of sound mind, then your relatives, next of kin, and your physicians must use any and all means available to prolong your life. In legal terms, they are bound to act only in your "best interests." In the absence of your own clear and unequivocal instructions as to what "best interests" means to you, they must rely on contemporary medical judgement. We have already seen what such reliance on the unthinking application of medical technology can mean.

This brings us to the first imperative message of this article. IT IS ESSENTIAL THAT YOU ESTABLISH GUIDELINES FOR YOUR MEDICAL CARE WHILE YOU ARE OF SOUND MIND AND IN GOOD HEALTH. THESE GUIDELINES SHOULD BE INCORPORATED INTO A PROPERLY WITNESSED LEGAL DOCUMENT WHICH IS ALSO SIGNED BY YOUR NEXT OF KIN.

Aside from the very basic consideration of wanting to escape costly, painful, and ineffective "heroic" medical treatment, there are a number of other medical contingencies to be provided for in a Medical Guidelines Affidavit. One of the worst possible disasters that could befall a cryonicist would be to be maintained on a respirator with no cerebral blood flow at or near normal body temperature. Respirator support is becoming an increasingly routine aspect of medical care. If a patient has had a massive stroke, cerebral hemorrhage, or other brain injury, spontaneous respirations may become inadequate or absent. In such situations, the patient can then be supported by mechanical means until it is either possible for him to breathe again on his own, or until it becomes clear that recovery is not possible due to brain death. In the vast majority of cases where stroke victims are respirator-supported, the end result is total cessation of blood flow to the brain and subsequent brain death. In cases of stroke or cerebrovascular accident which require respirator support, the brain has almost invariably been massively damaged by the time respiratory support becomes necessary. Resulting cerebral edema (brain swelling) is usually effective in shutting off flow to the entire brain within a few hours or, at most, days from the time of the original insult. It is incredibly rare for such an individual to recover to any degree where normal activities would be possible. If a cryonicist finds himself in such a situation, it would be very important to have stated in advance that frequent tests for cerebral blood flow should be performed. If at any time such blood flow is found to be absent, the patient is to be disconnected from the respirator and immediately pronounced dead so that suspension can begin at once. If the patient were to be left on the respirator on a heating blanket as is standard procedure, his brain--which would be receiving no blood flow--would simply decompose completely in a period of 24 to 48 hours. IT IS OF CRITICAL IMPORTANCE THAT A CRYONICIST NEVER BE EXPOSED TO THESE EXTENDED PERIODS OF NEAR-BODY-

## TEMPERATURE ISCHEMIA (no blood-flow).

At this point it is probably wise to talk about value judgements. Everyone is different. What may be an acceptable cut-off point for medical care in one case, may not be so in another. The above example is a case in point. At this time I do not feel that the benefits involved in surviving a massive cerebral infarct or bleed are worth the loss of brain structure and the tremendous compromises of quality of life such survival would entail. Being virtually a vegetable, confined to bed or wheel chair, unable to speak and probably unaware of any surroundings is not an acceptable alternative to being suspended. Therefore, in my case, I would never authorize being placed on a respirator in any circumstances where massive cerebral injury was suspected or documented. In my legal provisions I specifically request that respirator support not be used in the event that I suffer a stroke or other serious cerebral damage. Other people may not feel this way. They may feel that being alive in almost any condition is preferable to being dead and frozen.

Clearly these kinds of value judgements extend to other areas besides respirator support. The issue of chemotherapy and surgery for malignancies is a classic example. There are many situations in which I would simply refuse chemotherapy and other anti-cancer therapies because I do not feel that the risks and discomforts are outweighed by the possible benefits of the treatment. If I was diagnosed as having a disseminated solid tumor malignancy, I would refuse chemotherapy, use radiation therapy only for palliative purposes, and also refuse extensive nutritional and other artificial support such as hyperalimentation or other IV's to keep me hydrated near the end. In a clearly terminal setting the objective would be to check out as quickly as possible after a reasonable quality of life no longer exists.

In my own experience, most patients will continue to use medical support even though they are clearly terminal and even though the quality of their life had deteriorated to a blur of pain and painful medical procedures. I believe they do this not because they want to live, but because they are afraid to die. I too am unhappy at the thought of dying, but I feel very strongly that continuing to exist in such a state is not worth the price in misery being paid. Under such circumstances I would elect for an abbreviated terminal course and prompt cryostasis. I say this not because I have any overriding faith in cryonics working for me personally. Such is not the case. I hope it will work, and I think it could work, but I put the probability of success for anyone dying now as rather low. The point here is that the probability of recovery is even lower, and the probability is nil of getting any quality out of a cancer-ridden existence which requires medical support such as around-the-clock IV's. Cryonics thus becomes an attractive alternative for me. It is an alternative made even more attractive by the fact that an abbreviated terminal illness probably means less damage to be repaired.

Once again, it cannot be over-emphasized that the time to make such judgements and decisions is now, while you are in good health and able to document your intentions free from any taint of depression which may accompany a terminal illness. It is also very important to realize that most people do not die like movie characters--simply nodding off from consciousness with closed eyes and peaceful face.

Quite the contrary; most people are confused for days or weeks before they die, frequently requiring their eyelids to be taped shut days before they die. In short, they are in no position to make decisions or give directives about the scope or nature of their medical care.

What follows is a sample document, in this case my own, outlining limits on medical care. I have the same rights to set these limits as any other person. I have the same rights to refuse respirator support as does any Jehovah's Witness to refuse life-saving blood transfusions. This document may serve as a guideline for other cryonicists in establishing their own statements of limits. If you need help in drafting such an instrument, representatives of Alcor are ready and willing to be of assistance. We hope you will never need such a document; but if you do it will be incredibly important that it be there.

STATEMENT OF GUIDELINES AND LIMITATIONS ON  
THE MEDICAL CARE OF MICHAEL G. FEDEROWICZ

To: My Physician, and  
John Doe, Medical Surrogate/Power of Attorney

I, Michael G. Federowicz, of the City of Brea, County of Orange, State of California, being of sound and disposing mind and memory do hereby set forth guidelines and limits on the medical and surgical care I wish to receive should the need arise. I understand that life is full of uncertainties and therefore no decision concerning something as complex as medical care may be made without risk, in advance of confronting the situation where such decisions are to be made. I also understand that in many situations such decisions will be beyond my ability to make, due to incapacity from accident or the effects of disease. With these considerations in mind I have undertaken, after much careful, considered, and reasoned thought to set forth limits on the quantity and quality of medical care I wish to receive in the event I am incapacitated, incompetent, or otherwise unable to speak and act in my own behalf.

First, I appoint John Doe of 1657 Acacia Street, Fullerton, California 93454, to act as my surrogate in determining the type and extent of my medical care to be limited only by the provisions of this document. I have provided elsewhere for said John Doe to be granted Power of Attorney in the event of my incapacitation or incompetence. At such time as I become unable to make informed decisions concerning my medical care, I wish John Doe to make any and all such decisions.

Second, it is my wish that my life not be artificially prolonged or physiological functions be maintained by use of a respirator in the event of severe brain injury or damage from any cause including but not limited to; stroke, aneurysm, trauma, poisoning, or cardiac arrest. I stipulate that "severe injury" constitutes any condition or state in which flow to the brain is compromised, or electrical activity is absent (in the latter case where there are no overlying, reversible reasons for absence of electrical activity such as the presence of barbiturates or hypothermia). At the first indication of the absence of electrical activity or minimal or absent blood flow to my brain I instruct that I be disconnected from life support equipment and that my remains be promptly transferred to the Alcor Life Extension Foundation, having its

principal offices and place of business at 4030 N. Palm, #304, Fullerton, California 92621. To this end I authorize any and all tests required to establish continued cerebral viability, blood flow/electrical activity as may be required in the judgement of John Doe, my medical surrogate.

Third, it is my instruction that when two or more physicians determine that there are no reasonable prospects for recovery of both health and physical and mental independence during the course of any illness I wish all life support procedures to cease, including but not limited to respirator support, hyperailmentation, intravenous nutrition of any kind, hemodialysis, antibiotic therapy, chemotherapy, radiation therapy, and nasogastric or other passive nutritional support. Under such circumstances of severe incapacitation or terminal illness it is my desire and instruction that only care and comfort be given—defined here as shelter, care for personal hygiene and food and water as long as that may be taken by mouth in the normal fashion without the aid of nasogastric tube, feeding gastrostomy, or other medical or surgical appliance.

Fourth, it is my desire that following declaration of death by a physician that my remains be preserved by the post-mortem procedure known as cryonic suspension. I direct my physician and my medical surrogate John Doe to co-operate with the aforementioned Alcor Life Extension Foundation in carrying out this wish. I also direct that my remains be delivered to Alcor, it heirs or assigns without embalming or autopsy immediately after declaration of legal death. I hereby direct my physician to perform during the course of my illness any radiologic or other diagnostic tests required to establish the cause of my death or otherwise avoid the possibility of an autopsy. I enjoin my physician and medical surrogate from engaging in any procedure or therapy which would act to jeopardize my placement in cryonic suspension following declaration of legal death.

In witness whereof, I have hereunto subscribed my name and affixed my seal, the 26th day of April, in the year one thousand nine hundred and eighty three.

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Michael G. Federowicz

Page 2 of 2

Note: This document is intended as a speculative sample only. We invite comments and revisions from our readers, particularly those with a legal background. —MD

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"Wisdom is knowing what to do next. Skill is knowing how to do it. Virtue is doing it."

—David Starr Jordan

"The oak sleeps in the acorn, the bird waits in the egg... Dreams are the seedlings of reality."

—James Allen



## CRYONICS SCIENCE REPORTS

## pH AT LOW TEMPERATURES AND SURVIVAL OF FROZEN TISSUES

The chemical notion of pH in water solutions gives us a measure of the acidity (low pH) or alkalinity (high pH) of the solution; ultimately these properties of a solution depend on the concentration of hydrogen ions in the solute. Much everyday chemistry takes place in solutions of water at normal room temperatures; however if we try to extend the same methods of measuring pH or even the same concept of pH to temperatures other than the norm or to solutes other than water we have to modify the concept a good deal. Standard methods of measuring pH cease to be valid: after all, just what is the pH of a solution of nickel in molten iron?

Even for cryobiology this dependence of the standard notion of pH upon the fact that it deals normally with water at normal temperatures ie room temperature may turn out to be very important. Attempts to preserve organs or people involve the use of liquid solutions of water and an antifreeze cryoprotectant (usually glycerol or DMSO), and furthermore at temperatures definitely not "room temperature" even though the solutions used may be liquid. A very interesting paper by Michael J Taylor in CRYOBIOLOGY (19 (1982) 585-601) should greatly increase the attention cryobiologists pay to pH at low temperatures and in nonwater solutions because of its close study of the influence of pH on smooth muscle from guinea pigs at low temperatures.

Since pH depends on measurements with reference to a standard state, and this can be some liquid other than water, it has a special name, pH\*; since these measures depend also on the temperature the quantity resulting is called pH\*(-13) for a temperature of -13C. In his initial work, Taylor studied methods of calibrating and defining pH for solutions of DMSO and water at low temperatures (MJ Taylor CRYOLETTERS 1 (1980) 449 and his PhD thesis 1977). He had earlier also studied preservation of smooth muscle from guinea pigs in nonfrozen DMSO solutions at -13 C, but for this earlier work he used instruments calibrated in water at 37 C, a critical difference. Furthermore, his initial studies using "standard" measurements of pH gave little encouragement to the idea of storing muscle tissue or any tissue unfrozen at low temperatures; he found no recovery of muscle function for guinea pig smooth muscles stored at -13C at either high or low "apparent pH" (that is, pH measured as if the solution were at 37C and consisted of water) (Taylor M. et al CRYOBIOLOGY 15 (1978) 452).

His most recent paper has far more hopeful results, apparently due to his happy realization of the invalidity of standard measurements.

Cells and tissues will suffer damage if the pH is not optimum, that is, if the solution in which we keep them is either too acid

or too alkaline. To maintain solutions at the right pH, biologists and biochemists use special chemicals, buffers, which tend to maintain the solution at a fixed pH; the level of hydrogen ions (protons) in the solution determines its acidity or alkalinity, and buffers act to mop up extra ions or release new ones if the number of ions should deviate for any reason from the right level. Buffers also act differently depending on the temperature and the other components of the solution. In his most recent paper, Taylor wanted to find the right buffer for muscle tissue in DMSO solutions at  $-13^{\circ}\text{C}$  and also find the right pH\*; the distinction between pH (standard) and pH\* (properly defined for the system studied) is of course critical.

His paper is very detailed. The best short summary of his results is that the best pH\* for recovery of guinea pig smooth muscle from storage in 30% solutions of DMSO turns out to be at about 9.2 (! This is very alkaline in standard terms). The best buffer (from a range of buffers he had previously studied in Taylor M, Pignat, Y CRYOBIOLOGY 19 (1982) 99) turned out to be a chemical with the short name Tricine. He presents a good deal of other information, of course, on different buffers tested and response of the muscle to ranges of pH\*.

The muscle tissue he studied was guinea pig intestinal muscle, the taenia coli muscle. He is cautious about what the significance of these results are for cryobiological preservation generally: that is, we can't yet say what happens if we apply these insights about pH\* to other kinds of cell or tissue. However he does point out one very suggestive fact, which is that quite often in organ preservation it is the vascular system (the capillaries) which freezing disrupts, and smooth muscles are important components of the vascular system.

Of course at this stage we can only speculate on the significance of pH\* to cryobiology. His work did only deal with preservation of guinea pig taenia coli muscle in 30% DMSO at the relatively high temperature of  $-13^{\circ}\text{C}$ . However I believe this paper is still very important not because of any firm answers it provides but rather because of the many questions which it opens up. By showing that pH\* and buffering are not just questions, but previously unconsidered questions with answers which can have a very significant effect on survival, Taylor has thrown open a range of possibilities, and possible methods of preserving organs, not imagined before. It seems very unlikely that the end result of such study will leave us no better off than before.

# ORGAN PRESERVATION AT THE 19TH ANNUAL MEETING, SOCIETY FOR CRYOBIOLOGY

The 19th Annual Meeting of the Society for Cryobiology, in addition to including an attempt to secretly expel all cryonicists, also included the presentation of a variety of papers describing work done through the last year by cryobiologists on organ preservation.

Probably the most significant and suggestive paper was by G Fahy, DR MacFarlane, and CA Angell. These scientists have studied the problem of how to vitrify kidneys for their preservation. Popularly speaking, they are working on freezing kidneys, but in technical terms they are proposing something quite different.

Not all liquids will flow rapidly enough for us to see them do so without prolonged watching. A liquid, technically speaking, is a form of matter disordered on a molecular scale. We put one form of liquid in our windows and call it glass, and glass will indeed flow, although so slowly that it is only in very old houses that we might notice that the window glass has settled down towards the bottom of the window. If we cool ordinary water rapidly enough, it will not freeze (that is, adopt a crystalline form) but rather become an extremely slowly-flowing substance just like glass. That fact is the origin of the term vitrification. If we want to preserve organs at low temperatures we need not actually freeze the water in them: we could try to vitrify it instead. This would have advantages, particularly that when water freezes all salts and other substances in solution come out of solution and can damage cells. If the water vitrifies, however, this doesn't happen.

To vitrify pure water we would have to cool it very rapidly, far too fast for practical organ freezing. However cryobiologists have known for a long time that solutions of water and DMSO, if they contain enough DMSO, will vitrify at much more practical cooling rates. High pressure will also help cause such solutions to vitrify.

All this is theory, and explains why cryobiologists would want to study vitrification. Fahy has been perhaps the most vocal present advocate of vitrification for organ preservation; his work follows on earlier work by Farrant, who showed that some tissues could survive the concentrations of DMSO needed to vitrify. To preserve organs by vitrification, major practical problems need solving, however. DMSO is very toxic at the high concentrations needed; nor can tissues easily withstand very high pressures. Once we have vitrified these tissues, we want to "melt" the DMSO-water mixture without causing it to freeze sometime as we do so.

Fahy certainly does not yet have a standardized method of vitrifying organs. However in his paper (Abstr 62, CRYOBIOLOGY 19

(1982) 668-669) he and his coworkers present some further evidence and work they have attained on this problem. On toxicity of high concentrations of DMSO, Fahy et al have shown that polyvinylpyrrolidone (PVP, already known as a nonpermeating cryoprotectant) can reduce by 6% to 8% the amount of DMSO needed to vitrify; similarly another cryoprotectant, propylene glycol, will reduce the amounts needed. A mixture of only 29% DMSO with acetamide, and 10% propylene glycol, at a pressure of 1000 atmospheres, will vitrify. These concentrations are significantly low and therefore reduce toxicity; acetamide also helps to reduce toxicity. Fahy et al have also shown that rapid entry and removal of cryoprotectant can suppress toxicity at concentrations of DMSO-acetamide as high as 40% and that kidney cells will vitrify in mixtures of these types.

This work is hopeful but not conclusive; as cryonicists we would certainly want it pursued.

NA Halasz presented another interesting paper. Reading this article, you will have noted the attention to the problem that cryoprotectants are often toxic at high concentrations. Halasz did not study DMSO, but rather glycerol, known to be of much lower toxicity but still damaging. He did not, in fact, even freeze any kidneys, but simply study ways of reducing the toxicity due to cryoprotectants; his major result was that by combining two different cryoprotectants, glycerol and propylene glycol, he could attain total concentrations without toxicity much higher than possible with a single cryoprotectant. An equal mixture of glycerol and propylene glycol would allow total concentrations as high as 2.75 molar without damage to a kidney, while concentrations of only 1.75 molar of a single cryoprotectant would start to cause damage, increasing with the concentration (Abstr 57, CRYOBIOLOGY 19 (1982) 667).

I note in both papers an increased interest in mixtures of cryoprotectants, which might have less toxicity because the total amount of any one of these toxic drugs is much less than we would get if we tried to attain the same effect with only one.

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"I am only one, but still I am one. I can't do everything, but still I can do something; and because I cannot do everything I will not refuse to do the something I can do."

—E. E. Hale

"All progress grows out of discontent with things as they are."

—D. Kenneth Winebremer



BOOK REVIEW by Steve BridgeThe Myth of Senility; Misconceptions about the Brain and Aging  
by Robin Marantz Henig. Anchor Press, 1981.

When we talk about the advantages and pleasures of an extended lifespan, one of the first objections we hear is something like, "Oh, I don't want to be old. I couldn't stand to be senile." In various polls, more adults are afraid of becoming senile than are afraid of contracting cancer. And yet, as Ms. Henig points out in this excellent book, over 95% of people over age 65 are not senile and never will be. Henig goes on to describe how this misconception has damaged the lives and medical care of millions of older Americans.

The "myth" of the title does not mean to imply that senility does not exist. Henig includes several chapters on Alzheimer's disease, the true senility, including theories about its causes, the possibility of future cures (nothing very promising yet), and interviews with families who have to deal with the disease. She also provides many sensible methods for these families to provide as much happiness as possible for themselves and for the patient. Henig goes on to briefly discuss several other less common irreversible dementias, such as Huntington's disease and Korsakoff's psychosis. Her main point, however, is that the casual use of the word "senility" is not a diagnosis and that doctors who do not bother to follow up on mental impairment in elderly patients are performing an immense disservice.

Henig estimates (and backs up those estimates with figures) that up to 30% of elderly patients who show symptoms of disorientation, forgetfulness, even delirium, are not senile. They are physically sick and they are curable. Drug reactions are the most common cause of mental problems in the elderly, because factors like the body's chemistry and rate of blood flow change as the body ages. Several hospital studies have shown that as many as 15-20% of patients over age 70 have been given too much or inappropriate medication. The physical changes of aging create many other differences in expected symptoms. There are any number of conditions which produce distinct symptoms in the middle-aged person but which may create only memory loss or confusion in the elderly. These conditions include such treatable problems as a mild heart attack or stroke, low blood sugar, high blood pressure, malnutrition, hyperthyroidism, or even such infections as appendicitis or kidney infection. And of course there is basic depression, something which affects millions of Americans of all ages, but which is especially common in older people.

Henig strongly criticizes the way in which older citizens are treated in this society. Of course they are depressed. They are forcibly retired, ignored by their families, placed on fixed incomes in inflationary economies, and excluded from many activities, not to mention the normal health problems that become more frequent and more of a hindrance with advancing age. For the poor it is even worse. "Unfortunately, old people develop a dependence on supportive surroundings at the very stage in life when they have lost the income, friends, and clout needed to obtain them. One third of the elderly live below the poverty line; 30 percent live in the inner city, many of them in deteriorating neighborhoods....Surrounded by

decay, the old people who are the frailest and the most vulnerable have been known to decay as well." Many others are placed in nursing homes, in environments with all of the intellectual stimulation of a blank wall. Sensory deprivation produces depressions and hallucinations even in healthy young people. Imagine how much worse it is to someone who feels that he is at the end of his life.

Henig acknowledges the many changes which appear to take place in the brain with normal aging, including a gradual slowing of function. However, she insists that the vast majority of people can readily adapt to those changes as long as their other physical, emotional, and intellectual needs are met. There is a widely held stereotype that all old people are forgetful, confused, "senile." This is the "myth" which Henig wishes to expose. One of the great tragedies of aging is that if people believe that senility is inevitable, the myth can appear to become a self-fulfilling prophecy. The elderly cease to use their minds actively; their relatives begin to expect less of them (and consequently to get less); their families may disregard symptoms of a true illness, believing they are just part of the inevitable senility; and the young grow to hate the old out of fear of what they themselves will become. "Ageism...places its adherents in a quandry unique in the annals of bigotry. White racists do not suddenly wake up to find themselves black; male sexists cannot turn into women; but ageists are prejudiced against a minority group that they all one day will join. Thus, individuals who have grown up in our age-denying culture will grow old in an environment that fills them with self-loathing when they reach the magic age of sixty-five."

Henig saves her most damning blast for the medical profession in this country and the physicians' "tendency to brush off the elderly as quickly as possible" in medical examinations. A report by Robert Kane of UCLA, et al., published in 1980 by RAND Corporation<sup>1</sup> revealed that while the elderly make use of the medical care system more than any other age group (logical--they are sick more often), "physicians spend less time per person with their elderly patients than they spend with their younger patients." This "pattern of minimal care" was found to be even more pronounced in nursing homes, where the RAND study found "a conspicuous absence of complete examinations or active attention to therapy. Physician attention appears to be due more to a response to federal regulations than to a commitment to the nursing home patients."

Only about half of the nation's medical schools even offer geriatrics as an elective or as part of another course; and as late as 1978 only two schools offered a separate mandatory course on aging. This is almost inconceivable in a profession where nearly every practitioner except specialists in pediatrics and obstetrics will find that more than half of their patients will be aged. As Henig notes, "Most of the nation's 121 medical schools teach an ethic of dramatic cure and rapid recovery, heroics in the face of death until death itself is obliterated. Medical professors tend to emphasize in their lectures the diseases for which doctors can prescribe some drug or perform some operation; the chronic illnesses, which are alleviated only through time, patience, and a change in the definition of "cure," are considered too frustrating and too unresponsive to dwell on." Thus it is easy for these physicians to automatically attribute the mental problems of the aged to senility, old age, or

hypochondria and ignore them.

You probably already have aging family members for which you will eventually have some responsibility. You will also get old and less healthy. How long and how well you survive will be very much a product of how you are treated by your family and physicians. Reading this book is a first step toward protecting your health and mind and those of your family. You simply cannot afford to ignore Ms. Henig's messages. There is much more information here than I can possibly put into even a long review. This book has begun to change my views about older people and led me into some serious re-thinking about my own family. I urge you to seek out a copy of The Myth of Senility.

- <sup>1</sup> Geriatrics in the United States: Manpower projection and training considerations. By Robert L. Kane, et al., Santa Monica, CA, RAND Corporation, 1980. Summary was published in New England Journal of Medicine, vol 302, #24, 1980. p. 1327-32.

### Growing Up

by Tom Scott

To a child of five  
The magic of a switch  
Can turn night to day  
And banish darkness.

What wonder to a child of ten  
Is endless tons of rocket  
Stacked to take a man away  
And set him free from gravity.

And to a boy of fifteen  
The limits are not weight  
Or darkness on a mortal frame  
But death itself.

To break the chains of black mortality  
And lighten up the darkness is a  
Fitting quest.

For what is life-  
Free even from darkness  
And chains of gravity-

If death still waits-

If there is no switch to send it into  
Shadowed corners of a floodlit room?  
What is the use of going on without  
The magic switch of life to vanquish  
Death as Edison did gloom?

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