

CRYONICS

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**20th Anniversary of the Publication
of The Prospect Of Immortality**



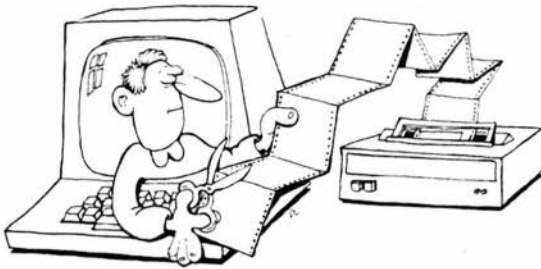
Robert C. W. Ettinger

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EDITORIAL MATTERS

If some of you have wondered why we haven't been running pictures every other issue, as we promised, there is a reason for this. Within the next couple of months we hope to publish a feature research article which will require a number of pages of photos. In order to stay within budget, we have had to withhold running pictures for several issues. Please, bear with us--we think the information we have to present justifies the loss of bimonthly photos.

Due to the controversy generated by a humor article (see the Letters to the Editors section) which appeared in the January issue of CRYONICS we have adopted a new policy regarding pseudonymous or anonymous submissions. In the future we will accept such submissions only in instances where the author has something of critical importance to communicate and stands to suffer intolerably as a result of such communication. In such cases we will take full responsibility for the accuracy and veracity of information disclosed in this fashion.

TWENTY YEARS OF CRYONICS

Many, if not most, cryonicists put the beginning of the cryonics movement in 1964 with the commercial publication of THE PROSPECT OF IMMORTALITY by Robert Ettinger. Ettinger had first published THE PROSPECT OF IMMORTALITY in a shorter, noncommercial form in 1962, and before that had published a brief article on the cryonics concept in the science fiction magazine STARTLING STORIES ("The Penultimate Trump", which appeared in the March 1948 issue). Nevertheless, it was the commercial publication of THE PROSPECT OF IMMORTALITY by Doubleday in 1964 that launched the cryonics movement and brought it many if not most of its current adherents.

Nineteen-eighty-four marks twenty years since the THE PROSPECT OF IMMORTALITY rolled off Doubleday's presses. For some of the pioneers still involved in cryonics it marks twenty years of personal involvement in a struggle for survival. For all of us, it marks the twentieth anniversary of the cryonics movement.

It has been a hard twenty years. We have had many disappointments and setbacks, but WE ARE STILL HERE. More importantly, we have made much progress and we are on firmer ground now than when we started. Certainly for those who have been involved since they first read Ettinger's book in 1964, the progress we have made, at least in relative terms, is nothing short of amazing. Considering how few of us there are, and the indifference and hostility which cryonics has attracted, we have made good progress indeed.

But, the purpose of this piece is not really so much to reflect on where we are or even where we have been, so much as it is to reflect on the debt of gratitude we owe the man who made so much of that progress possible. In the closing months of 1983, many of us here in Southern California have reflected on the achievement of Robert C.W. Ettinger in the publication of THE PROSPECT OF IMMORTALITY. In re-reading the THE PROSPECT after nearly a decade, I was no less struck by its power, its vision, and its genius. While it is true that

much of the peripheral social and scientific information and speculation are dated, the fact remains that the book was and is a work of genius. It is clearer now than ever that Ettinger understood in 1962 something that most people now living still don't understand: the world is on the edge of an era of great promise, an era of transformation and growth which will dwarf all other eras in human development, and most importantly that it is possible for many of us now living to reach that era—to participate.

Cryonics is such a simple idea. It is based on a few very simple realizations: you are only as dead as your medical science has advanced, you are not the matter you are made up of so much as the pattern in which it is arranged and given time we will probably learn to repair most kinds of disease and freezing related injury. Such simple, straightforward observations. Coupled with the observation that cooling living things to very low temperatures halts all biochemical activity, these observations constitute the basis of cryonics. Yet, simple as these ideas are, they are profound. Articulating them into a skeleton which will serve as a framework for personal salvation is the work of genius. The laws of motion are simple observations about the way the world works. They have transformed the world we live in. The laws of motion, of gravitation and the calculus did not change the world overnight, it took many decades for their offspring, the industrial revolution, to take root and grow. Nor was the application of these insights consistent or universal. Even powerful ideas take a long, long time to change the inertia of mankind's whole way of looking at the world. So it will be with Robert Ettinger's and Ev Cooper's idea. It will take time.

For those of us who understand what cryonics means, the revolution in perspective Ettinger has given us stands with the other great ideas in human history. Certainly, the prospect of indefinite personal survival is the most powerful idea in our lives.

Whether or not cryonics really "works" for us personally or not, for many of us it has been a ray of hope in a world of darkness, a light at the end of a tunnel of oblivion. For a few of us this hope has transformed our lives and given us back joy in a life that would have otherwise been condemned to end in certain darkness. To have made that kind of change in anyone's life is no mean achievement. Ultimately, that is the kind of change Ettinger's simple new idea will make in the entire world.

So, what I am trying to say here, both personally and on behalf of the cryonics community at large, is, THANK YOU Robert Ettinger. Thank you for having the genius, the foresight and the courage to write and publish THE PROSPECT OF IMMORTALITY, thank you for twenty years of cryonics, thank you for bringing hope to despair and light to where there was only darkness. Thank you for The Prospect of Immortality. For that, you will always have our gratitude.



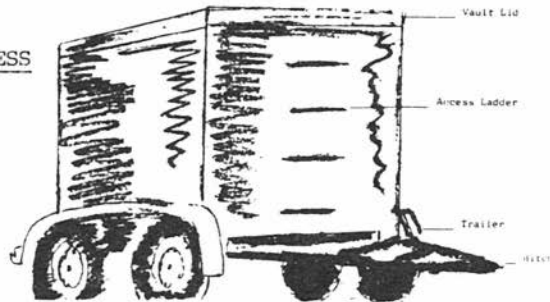
BACS FACILITY ON THE HORIZON?

For some time the Bay Area Cryonics Society (BACS) has been attempting to find a way to get a permanent facility for patient storage and for perfusion and administrative operations as well. The current facility in which BACS patients are housed is leased by Trans Time, Inc. There have been numerous problems with this facility including a somewhat hostile landlord, escalating rents and space reductions. Of course, the rent outlay alone has been a considerable burden and a tremendous drain on cash flow. Recently, the landlord at the Trans Time facility in Emeryville has stated that he does not wish to renew Trans Time's lease when it comes due in October of 1984.

In response to this situation several BACS members developed a plan to raise money for the purchase of a facility which would then be made available to BACS. Basically what the plan consists of is that BACS would locate a vacant lot in an appropriate area (we understand the area now being most actively considered is the Berkeley Hills) and a group of investors would then purchase the land, perhaps owning it in a general partnership. Once the land was acquired, a prefabricated steel building would be erected on a concrete slab—with installation of all needed utilities. Cost of the lot was estimated at \$35,000 and erection of a galvanized steel building on a concrete slab was placed at a little under \$25,000. The investors would then donate the lease to BACS with the provision that at the end of the lease period the facility must be returned to the investors in a satisfactory condition. The investors may then deduct the value of the donated lease of the facility from their income taxes. For those in a high tax bracket (50%) such an investment (with resultant tax deduction) results in a positive cash flow and an internal rate of return over a ten year period of approximately 23% after taxes.

While a few legal and tax questions about this arrangement remain to be resolved, we understand that an investment consortium has been formed and has already raised over \$30,000 of the needed \$60,000. We hope to report more on this as progress occurs. Anyone interested in more information should contact John Day and request a cryonics building fund agreement by writing John at 7710 Huntridge Lane, Cupertino, California 95014, (408) 255-8460, (phone after 5 pm).

CEPHALARIUM VAULT PROGRESS



So far the fund-raising effort for the cephalarium protective vault has raised over \$800! We are very pleased at this good early response. We plan more fund-raising efforts for this project in the coming months. We will not begin construction of the vault itself until at least half of the money required for the entire assembly (vault and trailer) are obtained. In the event we only raise enough money for the construction of the vault (approximately \$1,700) we will proceed with the vault and acquire the trailer at a later date. Our top priority is to get the ALCOR cephalarium into a protective container which decreases its hazards from earthquake and fire. Right now, we are a little under half way towards having enough money to construct the vault itself. If there's any way you can, please help us get to the \$1,700 mark by making a contribution TODAY!

LETTERS TO THE EDITORS

Dear Editors,



We were saddened and dismayed to see the short "thing" by "Enlis Bacchanal"

in Issue #42 of CRYONICS, which we feel reflects poorly on both ALCOR and CRYONICS as well as (particularly) the unnamed author .

1. This thinly veiled attack on a particular individual has no scientific or philosophical merit, yet the writer has been protected by a shroud of anonymity usually reserved for instances where a truly important idea must be disseminated in the face of political or peer pressure where the author might lose all sources of support if writer identity were known. The impression is that in this case, "Enlis Bacchanal" conceals a cowardly comic who lacks the courage to state criticism openly and specifically.

2. Regardless of how the piece reflects poorly on the author, it also reflects poorly on the publication which permitted it to be published. Not only is this poor journalism, but the publication virtually becomes co-author of the article by permitting the writer's identity to be concealed. CRYONICS has published many, many important and praiseworthy articles. Do these more than offset a few mistakes such as the present instance? Not necessarily. If the tablets in a bottle are 99% vitamin and 1% poison, do you have vitamins? or poison?

3. ALCOR's image is not enhanced by the publication of this sort of material, since it bears the greatest and longest term consequences. If an organization that proclaims a goal of preserving its members' identities indefinitely endures the distortion and damage of a non-member cryonicists' public identity in the pages of its publication...a distortion and damage of identity that serves no useful purpose, perpetrated by an individual hiding in the cloak of a pseudonym... how does this reflect on ALCOR's integrity? How can the membership and prospective members have full confidence in an organization that sanctions such behavior? Climbing very high requires extreme precautions against falling, and that will be a continual challenge in ALCOR's growth and development.

We hope this letter may help ALCOR and CRYONICS see this instance from the point of view that many other readers may hold. We know individuals in ALCOR well enough to know that there are all types, all different sorts of points of view, and that CRYONICS does its best to serve as a platform and forum for these...this does not change the opinion we hold in this case, due to the use of a pseudonym. We know that one sour apple doesn't make the whole barrel rotten...the general readership of CRYONICS does not know this. We strongly suggest that any future articles with personal overtones be avoided, or at least be published using the name by which the author is generally known, so that criticisms of this kind may be more directly focused on the writer and less on the publication and its underlying organization.

Sincerely,
Fred Chamberlain
Linda Chamberlain
South Lake Tahoe, California

Dear Fred and Linda:

First, I hasten to say that the article you are referring to was not intended as an attack, but as a humor piece. It was forwarded to us for publication by Art Quaife (a close friend and associate of Paul Segall's) and was received, evaluated and published without any malice or hurtful intent. Paul Segall knows about the article and is not offended and in fact finds it amusing.

The article was passed around here locally before it was published and the

reaction was nothing like yours. The overwhelming majority of the ALCOR staff found the article amusing and did not feel it represented any kind of personal attack. In part, this may be due to our awareness of the source—the northern California cryonics group itself, and Art Quaife in particular. As the editor responsible for inclusion of this article I must say I didn't give it a great deal of consideration. In retrospect, I should have specifically labelled it humor, stated the source and confirmed in print that the "subject", Paul Segall found the article amusing and to his liking.

In re-reading the article I must say that I find its tone to be one of absurd humor rather than biting satire. Perhaps this a matter of perspective and taste, as well as awareness of the source of the piece.

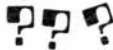
CRYONICS does not often run humor pieces. We have been criticised for this in the past. Indeed, Thomas Donaldson, who is currently visiting in the United States, said he found "A Life in Science" very funny and felt we needed more such humorous articles in the magazine.

Of course, the real question is what our readers thought of the piece, and on that question I would not, at this point, be willing to hazard a guess. I would be interested to hear from them and get their opinions.

Certainly all of this points up the need to be more careful in labelling humor as humor (Donaldson's essay on cryonics and the catholic church entitled "The Salvation of Cryonics" in issue #15 was apparently taken seriously by some as we received several letters and post cards complaining about the practical obstacles and political hazards of his proposal!). It is probably also wise to avoid, as you suggest, publication of humorous articles which involve real people and may be subject to misinterpretation. Perhaps the lesson here is that inside jokes should stay inside jokes. And yet, what is CRYONICS but an insider's magazine?

We will try to be more careful in the future. We apologize if we have offended anyone—it certainly wasn't our intention. —M.D.

THE QUESTION COLUMN



This column is a new feature—to appear regularly or irregularly as time and space permits. Questions may be submitted by readers or contributors who sense an area of ignorance that needs addressing. Questions may be either very basic and general or quite technical and specific. All kinds are welcome.

Q. Why are there two separate storage facilities in California, each with only a few patients in them? Wouldn't consolidation make more sense? Also, why are you people storing bodies in EARTHQUAKE COUNTRY? Wouldn't a facility somewhere more geologically safe and centrally located be better?

—R.B. Cincinnati, Ohio

A. The problem of too many storage facilities is one which has plagued cryonics from its start. At most times there have been almost as many patients as facilities. This has occurred for a variety of reasons. First, the best way to assure proper care for patients is to do it yourself. This is especially true in the early days, when there are few guiding standards and many judgement calls necessary. To a great extent, the existence of two facilities in California has occurred as a result of a strong desire by both responsible agencies (ALCOR and BACS/TT) to have their patients near their administrative centers and under the control of individuals and agencies whose judgement they trust and whose policies and philosophies of care most closely match their own.

This counts for a lot, and may even outweigh in value the apparent inefficiencies of two separate facilities.

In ALCOR's case we are much more heavily committed to neuropreservation than the Bay Area Cryonics Society. We are also considerably more paranoid about security and the effect of the media than our Northern California cohorts. This, coupled with different standards for cryogenic care (daily check policies, alarm requirements and so on), was a major factor in our decision to begin caring for our own people ourselves. Also, the cost factor must be considered. Because we have volunteer labor available, and own rather than lease our patient dewars, we are able to obtain storage for about half the commercial rate available through Trans Time.

Perhaps in the long run standards and philosophies will converge to the point where separate facilities are no longer desirable. At that time, no doubt a consolidation will take place. There is of course always the possibility that economic exigencies will impose themselves making "value judgements" a secondary factor to just keeping people in suspension. Let's hope that doesn't happen.

As to the issue of earthquake safety, this is a problem which to some extent relates back to your first question. Cryonics facilities are going to be near the cryonics groups they service. Requirements of manpower, supervision and so on dictate this. It is a fact that there are a large (perhaps the largest) number of cryonicists in California and that these people will only be comfortable with facilities near to them.

With this consideration in mind the next question becomes: is it possible to protect against earthquakes or to minimize their risk? And perhaps more to the point, just how big a risk do earthquakes represent? The answers to these questions are not easy.

First, you may be surprised to know that the area you are living in has a risk of earthquake comparable to many areas in California! I remember being quite surprised to find that the area of Indianapolis I used to live in had experienced a severe earthquake about 170 years before—one severe enough to level the current city of Indianapolis. This earthquake went largely unnoticed because 170 years ago there were no large cities or even settlements in the earthquake area. So, picking a low risk environment can be a bit problematic. In areas like the midwest where geological activity is less common (but often no less severe when it does occur) little attention has been given to fault lines and little is known about the likelihood of the next earthquake.

In Southern California we have tried to adopt a strategy which gives us maximum protection. First, we located in an area which is REMOTE from known faults and which the "experts" (in this case the California Dept. of Mines and Geology) tell us is at risk for only light damage during even a severe earthquake in the greater Los Angeles area. We also picked an area which is remote from ground water making the soil more stable and less likely to succumb to liquefaction during a quake. A final consideration in choosing a site was to have it in a "better" part of town. In our case we are less than a mile away from the town of Brea—a community of 30,000 located in North Orange County. Our environment is one of quiet, middle class residences, farm land, and light industry. It is a pleasant, suburban environment unlikely to be as hard hit by civil disorder following a major disaster as more urban locations are.

Beyond minimizing our risks of being severely damaged in the first place by picking a good location, we have taken every step possible to cut our losses in the event of a disaster and to continue caring for our patients. ALCOR is well provisioned against disaster. The final phase of our disaster protection program is the construction of a heavily steel reinforced concrete vault to protect our patients against the collapse and burning of the structure in the

event of an earthquake.

Perhaps, in the more distant future, cryonics facilities will be more centrally located in more geologically stable parts of the country. But that time is probably going to be a while in coming. Such a facility, regardless of where it is located, will still have to be heavily hardened against natural disaster whether it be earthquakes or floods, tornadoes or civil unrest. Every area has its risks, and it wise to consider these before being too hard on California's earthquake problem.



CONSIDERED YOUR ALTERNATIVES LATELY?

Perhaps you should let ALCOR protect you. If you would like information or assistance in making cryonic suspension arrangements please call or write:

ALCOR LIFE EXTENSION FOUNDATION

4030 NORTH PALM #304
FULLERTON, CALIFORNIA 92635
(714) 738-5569



REPORT ON THE 20th ANNUAL MEETING
OF THE SOCIETY FOR CRYOBIOLOGY

The Society for Cryobiology met in Cambridge, England, August 30 through September 2, 1983 for its 20th annual meeting. This unusually short (three days as compared to an usual length of four days) meeting was inundated by 182 papers (compared to 55 papers in 1981 and 104 papers in 1982), four symposia, and numerous workshops, and featured old movies of Audrey Smith freezing hamsters and new movies of plant cells extruding material, plus a lot more. There was an unprecedented emphasis on organ preservation at the meeting -- one symposium on organ cryopreservation, one workshop on organ cryopreservation, three sessions on organ and tissue cryo and liquid state preservation, and several poster sessions on these subjects. One of the posters, in fact, establishes a modern first for a Society for Cryobiology meeting -- the presentation of research results of two prominent cryonicists, Jerry Leaf and Mike Federowicz (an event which will be discussed in a separate article by Jerry Leaf). With so much going on in such a short time, no one individual could hope to see even a majority of the more interesting papers and events. Consequently, the following review is based to a great extent on the recently published meeting abstracts (Cryobiology 20:698-752, 1983).

This meeting review will depart from the well-established tradition of touching only a few highlights and ignoring contributions that are not very prominent. Instead, the coverage will include every significant paper presented at the meeting, and will be as detailed as possible. Of course, "significant" here means relevant to cryonics. Unfortunately, as the workshop on organ cryopreservation has no written records, it will not be reviewed here. In order to manage this considerable task, the subject matter will be divided into four parts: tissue and organ cryopreservation; tissue and organ liquid preservation; fundamental cryobiology; and miscellaneous. The complete coverage will be divided into at least two parts, the second part to appear in the next issue of CRYONICS.

TISSUE AND ORGAN CRYOPRESERVATION

In view of the fact that the meeting was hosted and arranged largely by David Pegg's MRC (Medical Research Council) Medical Cryobiology Group, it is perhaps not surprising that the very first symposium was the one on organ preservation. There were five papers in all. The session was chaired by Dr. N.A. Halasz, who published two papers long ago which claimed success after freezing dog kidneys to below -50 degrees centigrade. (Unfortunately, no one at the moment seems able to match this feat.)

The first paper was an overview of organ cryopreservation authored by I.A. Jacobsen and D.E. Pegg. Unfortunately, it seemed to contain very little that was new, and to leave out too much of what was old. Emphasis was placed on osmotic damage from cryoprotectants; the difficulties of heat transfer; the role of ice in producing mechanical damage, particularly to the vascular compartment; and means of overcoming these problems. The basic conclusions were that the use of rather high concentrations of cryoprotectant and slow cooling rates are probably the most promising approaches for the future.

The next paper was by Peter Mazur, who basically covered the same territory described by him in a chapter in Organ Preservation for Transplantation (second

edition, A.M. Karow, Jr., and D.E. Pegg, editors, 1981, Marcel Dekker). He compared and contrasted many aspects of freezing isolated cells versus whole organs, but these comparisons were largely theoretical rather than experimental. Perhaps his most interesting point was that in organs there is a high ratio of cell volume to total volume, and that in cell suspensions freezing damage is most severe when this condition is present. However, much evidence contradicts the idea that this is important in whole organs, and Mazur seemed unaware of this contradictory evidence.

C.J. Hunt of David Pegg's group then presented an interesting paper of techniques which allow visualization of ice in frozen organs and tissues. These techniques are now of major importance in view of the current consensus that ice is mechanically damaging to organs but that the location of the ice can be controlled so as to minimize the degree of damage. Hunt discussed the use of freeze substitution, isothermal freeze fixation, and inert dehydration, giving many examples of the results that can be obtained by these methods, and describing the advantages, disadvantages, and pitfalls of each technique. This type of technology is one tool that is now giving cryobiologists an idea of what is really happening when organs are frozen.

The fourth paper in the symposium was given by Armand M. Karow, Jr., who once served on the Scientific Advisory Council to the Cryonics Societies of America and who used to write articles for Cryonics Reports about cryobiology. Dr. Karow described the essentials of electromagnetic (microwave) warming and thawing technology, which is now capable of warming frozen dog kidneys at around 20 degrees centigrade per minute and thawing them with good thermal uniformity (no "thermal runaway"). Although the basic content of Karow's talk has appeared more than once in other places, his slow, careful discussion should be helpful once the organ cryopreservation symposium is published in a forthcoming issue of Cryobiology. The optimal technique now combines microwave and induction heating and uses advanced computer modeling to control delivery of energy to the organ.

The final contribution to the symposium was presented by G.M. Fahy and consisted essentially of an update on both the theory and practical advances toward vitrification. Fahy presented a significant amount of apparently new material, but unfortunately went through the presentation too rapidly for most of the audience to follow adequately. Nevertheless, it was clear that an exciting amount of progress has been made to date. Since this paper will soon be published in Cryobiology, we will defer a detailed review until we have the published paper in hand. The bottom line, however, is that so far the method is promising but not perfected, and a great deal of work still remains to be done.

The organ cryopreservation symposium was followed by a session on organ cryopreservation which generally contained more interesting material than the symposium itself. The first paper was given by Peter Clark, a postdoctoral fellow working in A.M. Karow's laboratory. Clark and Karow found that the toxicity of dimethyl sulfoxide was affected by the composition of the perfusate the dimethyl sulfoxide was contained in. They used the K/Na (potassium to sodium ratio) of slices of kidney as a test of viability. At 25 degrees centigrade, the K/Na dropped after exposure to 2.1M dimethyl sulfoxide (15% v/v) when the dimethyl sulfoxide was in "solution A" (a K and Mg rich solution), but K/Na did not drop until dimethyl sulfoxide concentration went to 3.5M (25% v/v) if Red Cross Preservative Solution-2 (RPS-2 a solution in which a large part of the osmolality is provided by glucose rather than electrolytes: a modified version of this solution is used in human cryonic suspension operations.) rather than solution A was used. Higher K/Na was found if 3.5 or 4.2M dimethyl sulfoxide was used at 10 degrees centigrade. Binding studies indicated the RPS-2 prevents irreversible binding of dimethyl sulfoxide to proteins by virtue of the high concentration of glucose in RPS-2. Furthermore,

the protective effect of RPS-2 against dimethyl sulfoxide toxicity was reduced if the glucose was replaced by other similar molecules (mannitol, sucrose, or inositol). Apparently glucose penetrates into cells of the kidney to protect their proteins against damage otherwise caused by dimethyl sulfoxide. This is a major advance in cryobiology and one with probable practical significance for cryonics.

Donald Lee, B.R. Dubbs, and B.C. Galland's paper followed. They used a normothermic (35 degrees centigrade, close to body temperature) perfusion technique to assess the effects of a 30 minute cryoprotective agent (CPA) perfusion on the rat liver. They jumped directly from no CPA to 15% v/v glycerol, 15% v/v dimethyl sulfoxide or 0.3-0.45M polyethylene oxide (PEO) (molecular weight: 400), then after 30 minutes, jumped back to 0% CPA in one step. Not surprisingly, this osmotic insult was more damaging in the case of glycerol, which permeates slowly, than in the case of dimethyl sulfoxide or PEO.

The next paper, (by Levin, Pegg, Karow, and Diaper) similarly explored the effects of blasting kidneys directly with roughly 2 osmolal concentrations of glycerol, dimethyl sulfoxide, propylene glycol, methanol, or sucrose at 10 degrees centigrade. Unlike Lee's paper, however, the use of a direct step to 2 Osm CPA in this experiment represented a reasonable technique in that the object of this study was to monitor both water loss and CPA gain by rabbit kidneys under fairly extreme (so the changes would be easier to monitor) but also fairly uniform and standardized conditions. The measurements were intended to give values for certain constants needed for a mathematical model of kidney perfusion with CPAs developed by R.L. Levin. Evidently reasonable values for these constants were obtained. These can now be used to predict the optimal protocol for loading and unloading CPA in the case of the rabbit kidney. These results are of clear relevance to cryonics, as they should help reduce toxicity while maximizing cryoprotection, but application to whole heads or especially to whole bodies remains a distant benefit at present.

The following paper by Pegg, et. al. presented some new and fundamental information about damage in rabbit kidneys frozen in the presence of 2M glycerol. Earlier results based on kidney blood flow after reimplantation and on vascular resistance were supplemented here by metabolic data. The metabolic data proved consistent with but more sensitive than the earlier whole organ data and allowed identification of an optimal cooling rate and an optimal warming rate. The optimal cooling rate was around 1 degree centigrade/minute, although rates as low as 0.02 degrees centigrade/minute also gave appreciable recoveries (higher than those obtained at 3 degrees centigrade/minute). The optimal warming rate was also around 1 degree centigrade/minute. These results are very relevant to cryonics because they represent the first attempts to define optimal freezing procedures for whole organs. They also are significant because they document measurable recoveries of renal cellular functions after freezing to dry ice temperature, an accomplishment that is not trivial by any means. The best news is that they now have a way to further optimize preservation. The measurement of K/Na ratio and/or of PAH uptake has been shown to provide "feedback" to the experimenters to tell them how their manipulations affect the kidney. Probably the next manipulation will be to repeat the entire cooling rate/warming rate study but at a higher concentration of CPA.

The following paper was also very interesting (K. Kurten, N. Fischer, et. al., from Germany). It was shown that dog kidneys perfused with 1.5M dimethyl sulfoxide, frozen to -20 degrees centigrade and held for 15 minutes at that temperature, thawed and transplanted after dimethyl sulfoxide washout, retained two thirds of their combined secretory capacity and blood flow (based on PAH transport), two thirds of their oxygen consumption (this depends partly on oxygen delivery to the organs and therefore on blood flow), and one third of

their filtering rates. A key element in this degree of success was the use of helium perfusion. This plus the use of dimethyl sulfoxide rather than glycerol might explain why these results are better than those obtained by Pegg's group in similar experiments done a few years ago.

The next paper was also of great interest and seems to represent a new record in cardiac cryopreservation. It was authored by F.I. Chaudry, J.B. Harness, and G.I. Irvine. Using a microprocessor to control thermal history, perfusate flow rate, and CPA addition and removal, they protected rat and rabbit hearts with 3M ethylene glycol and froze them to -20 degrees and -24 degrees centigrade. Although their emphasis was on a Fourier analysis (wave analysis) of the heart electrical activity after thawing, the important result was that these hearts could also beat upon warming and CPA removal, a result so far not achieved by anyone else. The electrical activity was abnormal, but just how abnormal is not clear.

The session was closed by Sajio Sumida, the colorful Japanese investigator who reported seven years ago that rat heart muscle excised after brief cardiac flushing with CPA and frozen to -196 degrees centigrade would spontaneously fibrillate when thawed. Each year since then, he has been thawing samples of the originally frozen materials to see if any deterioration takes place at -196 degrees centigrade. Now, after seven years, the results are still the same: no difference compared to the samples thawed seven years ago. Although we cryonicists (as well as most cryobiologists) assume that deterioration at -196 degrees centigrade will be virtually nil, there are actually few experiments that explore this for very long storage times. We should therefore look forward to Sumida's continuing results on this point.

Cryopreservation surfaced again at the evening "Conversazione", which consisted of cryobiology films, miscellaneous posters, a cash bar, and dinner, all running concurrently. Michael Taylor and P.J. Davisson of Pegg's group reported studies of corneal cryoinjury during frozen or unfrozen storage in dimethyl sulfoxide solutions at -13 degrees centigrade. Interestingly, they found that, unlike the situation in kidneys and smooth muscle, the cornea is damaged more by the osmotic stress accompanying freezing than by the physical presence of ice. Ray Rajotte reported on his continuing studies of rat islet of Langerhans cryopreservation. (Pancreatic islets make the insulin needed in many forms of diabetes.) He found much better islet preservation if he cooled slowly (0.26 degrees centigrade/minute) to -40 degrees centigrade, plunged into liquid nitrogen, and thawed rapidly than if he simply continued slow cooling all the way down to -75 degrees centigrade and then thawed slowly. Evidently considerable cryoinjury can occur below -40 degrees centigrade if time is allowed for it. In a companion paper, Rajotte and associates reported, however, that dog islets preserved using the slow freeze to -75 degrees centigrade and slow thawing actually behaved similarly to nonfrozen control islets in their ability to control the biochemical symptoms of diabetes. The CPA used in both experiments was 2M dimethyl sulfoxide.

M. Wise et. al. similarly found that pig islets retained a relatively normal appearance after cooling (1 degree centigrade/minute) to -60 degrees centigrade using 2M dimethyl sulfoxide and plunging into liquid nitrogen. They were also thawed relatively slowly (10 degrees centigrade/minute). The freezing process, however, destroyed contaminating cells also derived from the pancreas. Michael Taylor and M.J. Benton of Pegg's group also joined the islet wave, reporting that rat islets protected with 2M dimethyl sulfoxide survive almost independently of the cooling rate used (ranging from 0.3 to 1000 degrees centigrade/minute), but seem to do somewhat better when rapid (50 degrees centigrade/minute) versus slow (10 degrees C/minute) warming is used. Taken together all of these papers seem to indicate that slow cooling down to about —

40 degrees centigrade followed by rapid cooling and rapid warming seems to be the best protocol, except for systems such as dog islets which survive despite an evidently sub-optimal protocol.

The final session on tissue and organ cryopreservation was session #17. It began with another paper by Wise et. al., this time on diffusion of dimethyl sulfoxide into pig islets. In these experiments, radio-labeled dimethyl sulfoxide was used in tracer levels, allowing dimethyl sulfoxide diffusion to be followed by monitoring the number of counts (radioactive disintegrations) in the islets at different times. Wise et. al. found equilibration within 3 minutes at room temperature (presumably) but not until 30 minutes at 0 degrees centigrade. Washout studies at 0 degrees centigrade (2M dimethyl sulfoxide washed out by exposure to 0.74M sucrose) showed 86-87% washout within 3 minutes in both fresh and frozen-thawed islets. S. Sandler and A. Andersson froze mouse islets slowly (5 degrees centigrade/minute) in 2M dimethyl sulfoxide thawed them rapidly, and cultured them for seven days. They found that islets frozen immediately after collection survived poorly, but if the islets were cultured for two to seven days before freezing, they showed virtually complete recovery. Post-thawing culture was much less important, but showed some benefit after two days, possibly because cells killed in the freeze-thaw procedure were destroyed after two days and therefore no longer affected the overall results for the remaining viable tissue.

More islet work was described by Grundmann and associates. They froze rat islets, transplanted them to diabetic rats after one week of liquid nitrogen storage, and found 20 out of 29 diabetic rats completely cured one year later. The other 9 rats were almost completely cured as well.

Thul et. al. then discussed their work on freezing of liver cells. They froze the isolated cells in 15% dimethyl sulfoxide plus 10% fetal calf serum at 0.5 degrees centigrade/minute to -70 degrees centigrade, then stored them one week in liquid nitrogen. Seventy-five percent of the cells allegedly survived. When injected into rats with experimentally-induced liver failure, the survival rate of the rats was about 90% of the survival rate of rats injected with non-frozen liver cells. This is a spectacular result in view of the rather dismal results of other researchers. For example, Eric James, Barry Fuller, and co-workers found that viability of hepatocytes protected with 1.5M dimethyl sulfoxide and frozen at 1 degree centigrade/minute was lost at -20 degrees centigrade, although this killing temperature could be lowered somewhat by raising the dimethyl sulfoxide concentration. When viewed in the cryomicroscope, the cells behaved normally during freezing but swelled lethally upon thawing. The only apparent differences between the two laboratories techniques were slightly lower cooling rate and inclusion of 10% fetal calf serum in the successful experiments. Presumably, inclusion of fetal calf serum is the deciding factor. If so, this could have implications for organized tissues of other organs. It would also have very important mechanistic/theoretical implications. As it stands now, the life-saving effects of frozen liver cells might have immense importance for salvaging victims of liver failure. Rather than waiting for the needed liver to become available for transplantation, in the next several years such victims might be able to obtain previously frozen liver cells from the "liver bank". Hopefully, this work will be followed up.

S. Randolph May and colleagues next reported on a method for freezing skin without a controlled-rate freezer. Basically, the skin was put into an insulated box and the box put into a deep freeze at -70 degrees centigrade. Survival was as good as could be obtained using an expensive controlled-rate freezer.

F. Penninckx, R. Kerremans, and W. DeLoecker next described disappointing

results with the cryoprotection and cryopreservation of dog intestine, although electrical stimulation could still contract the smooth muscle present. They concluded that the requirements of the smooth muscle were different from the cryobiological requirements of the rest of the intestine (mucosa), but that neural receptors could be preserved.

G. Collins, N. Halasz, and W. Wicomb were next in line. They reported more data on a phenomenon which may be of critical importance, namely, the so-far inexplicable and rapid deterioration of kidneys kept at high subzero temperatures (-5 to -7 degrees centigrade) without freezing. For the first time, Collins et. al. reported that this phenomenon is not restricted to whole kidneys but could also be seen in kidney slices supercooled to -4 degrees centigrade for one hour. Whole kidneys kept at -4 degrees centigrade for one hour also showed significant deterioration. This damage was not caused by freezing, nor was it related to cooling rate. However, if the organ or the slices were loaded with 1M glycerol plus 1M propylene glycol prior to cooling, the "mystery phenomenon" disappeared! The situation is still rather confusing, but these results are very helpful and are the first sign that the problem can be suppressed.

W.N. Wicomb and colleagues found a beneficial effect of glycerol (136mM) in the perfusate of hypothermically preserved isolated baboon hearts perfused 24 hours and then transplanted orthotopically. Without the glycerol the hearts did poorly, but with the glycerol the hearts function normally. Similarly, Collins, Wicomb, and Halasz found that 300mM glycerol or 300mM propylene glycol prevented perfusion-related damage to rabbit kidneys preserved for up to 24 hours at 7-10 degrees centigrade by continuous perfusion. Neither group could say why the CPA helped. Regardless of the mechanism, the results are encouraging. They suggest that cryonics perfusions should perhaps not begin at a zero molar concentration of CPA.*

Clark, Lippert, and Karow continued to report on their interesting results with kidney slices. They found that the carrier solutions used to keep the kidney cells alive while CPA was introduced and removed affected the permeation kinetics of dimethyl sulfoxide, glycerol, and ethylene glycol. Dimethyl sulfoxide permeated the fastest and ethylene glycol the slowest of these agents. Various bizarre effects were seen, such as dimethyl sulfoxide rising to a concentration that was higher inside the cells than in the extracellular solution in one case. Although confusing, these experiments are important for the establishment of the fundamentals of cryoprotection of kidneys and other organs and organisms.

This session was closed by another paper on the use of Fourier analysis on hearts preserved with ethylene glycol. As before all of the results were improperly stressed but this reviewer is glad to see more work on the freezing of hearts to about -25 degrees centigrade with ethylene glycol.

This concludes part one of our coverage of the 1983 Society for Cryobiology meeting. In part two we will continue with non-frozen methods of organ and tissue preservation, fundamental cryobiology, and miscellaneous findings of interest.

* Starting out with some CPA present is even more critical in ischemic human perfusions. In early human perfusions there was usually an attempt to achieve blood washout before beginning cryoprotective introduction and this resulted in massive edema which was not reversible with subsequent hyperosmotic CPA perfusion and which led to early termination of the perfusion. This editor was instrumental in stopping this practice a number of years ago after identifying a

similar phenomenon in experimental animals. Consequently, all recent perfusions have been initiated with about a 5% w/v concentration of CPA present in the "washout" solution.

FEB - APR 84 MEETING CALENDAR

ALCOR meetings are usually held on the first Sunday of the month. Guests are welcome. Unless otherwise noted, meetings start at 1:00 p.m.

ALCOR

ALCOR LIFE EXTENSION FOUNDATION

4030 NORTH PALM #304
FULLERTON, CALIFORNIA 92635
(714) 738-5569

The FEBRUARY meeting will be at the home of:

(SUN, 5 FEB 1984) Bernie and Sondra Krakower
13121 Garden Land Road
Los Angeles, CA 90049
*** Please R.S.V.P.- Tel: (213) 472-9200
or ans. service- Tel: (213) 477-7209

DIRECTIONS: Take Interstate 405 (San Diego Fwy) to Sunset exit, go West on Sunset approx. 3 miles to Mandeville Canyon road. Go North on Mandeville Canyon Road approx. 5 miles to Garden Land Road. Turn left (West) on Garden Land Road. 13121 is approx. 1 block on the right side of Garden Land Road.

The MARCH meeting will be at the home of:

(SUN, 4 MAR 1984) Mike Darwin
350 W. Imperial Highway
Apt. #13
Brea, CA 92621
Tel: (714) 990-6551

DIRECTIONS: From the West, take Interstate 5 (Santa Ana Fwy) to Imperial Hwy (Hwy 90) and go East 10-11 miles. From the East, take Hwy 57 (Orange Fwy) to Imperial Hwy (Hwy 90), and go West about 1 mile. 350 is on the South side of Imperial Hwy.

The APRIL meeting will be at the home of:

(SUN, 1 APR 1984) Paul and Maureen Genteman
535 S. Alexandria #325
Los Angeles, CA 90020
Tel: (213) 386-2265

DIRECTIONS: Depending on the direction from which you are coming, take either Interstate 10 (Santa Monica Fwy) or Hwy 101 (Hollywood Fwy) and exit at Vermont Ave. From the Santa Monica Fwy: Go North on Vermont approx. 2 miles to 6th St. From the Hollywood Fwy: Go South approx. 1 mile to 6th St. Go West on 6th 4 blocks to Alexandria. Turn right on Alexandria. 535 is the first apartment building on the West side of the street.



INTERVIEW WITH MICHAEL DARWIN (FEDEROWICZ)--PART II

by Simon Carter



(The following is the second part of a two part interview with Mike Darwin, President of ALCOR.)

Where do you feel cryonics is at present and where should it be going?

Where we are at depends a lot on whether you are an optimist or a pessimist. Who knows what the future will hold?

As to where we should be going? On a most basic level we should be consolidating our position and increasing our stability, as I've just pointed out. We must get to a position where we have good reserves of labor and capital, where our income exceeds our expenditures. This will be hard. The changes I have just spoken of will not come easily. There will be much bloodshed. The problem has been that in the past cryonics has never really had any bloodshed. What you have had is a situation where organizations just wasted away or were gnawed to death a little at a time. This was largely because there were NO resources. Also, no one ever got to the point where they had a clear lead of some kind; technical, social or otherwise. This is still mostly true but it is changing. The take-home-message here is that whoever has the most aggressive and effective program offering whatever people perceive the real essentials to be, is going to win. Winning here is a term that is a poor description of what the guy who's left gets. All he gets is a tremendous responsibility to keep going. It is going to be rough, the pressure will really be on because the winner represents the focal point of all or most of the available resources.

Does that imply he has the "Right Stuff" to succeed?

Not at all, and there's the rub. It depends so much on the quality of the people who end up controlling the resource pie. And we are speaking of a resource pie here—a fixed quantity like land—because no one has found a way to mass produce cryonicists. This is the capitalists' worst nightmare. The ultimate bad dream in a libertarian's good night is "what if you can't make more?" That is why cryonics has had such an ugly social history. This tremendous drive for success and survival I spoke of earlier cannot yet be channeled creatively. So far, no one has gotten the critical mass to start a self-sustaining reaction. This is a terrible problem, it makes us tribal, puts us back to where someone has got to be chief. Just like a hunter/gatherer tribe we are faced with an absolutely fixed amount of resources and for the moment there isn't much we can do about it. The worst thing that could happen is that we go on in this tribal fashion with no one having a clear mandate of leadership. This kind of situation leads to Machiavelli's Italy of three hundred years ago. Little city states each with their own duke and holy mandate, little city states fragmented and disordered, weak and incapable of defending themselves against the ravages of a hostile and indifferent world. We must not let that happen to us. We must find a way to consolidate all of the resources available into a coherent whole. We must do what we have to in order to survive.

What will surviving take?

A total commitment to cryonics. A ruthlessness about keeping our people in suspension which goes beyond anything practiced so far.

Are you saying that if you run out of liquid nitrogen money you just go out and knock over a convenience store?

I said ruthlessness, not stupidity. Often there is a fine line between the two. Often an impossibly fine line.

How do you tell the difference?

Why, that's very simple: you continue to exist. Often, maybe most often, that's the only way you have of knowing you did the right thing.

Have you had to be ruthless in your role as president of ALCOR?

Yes, and most often I've had little certainty that what I was doing would work and would be the right thing to do. The stakes are so high since this area is so new, volatile and completely full of unknown pitfalls. Some people have accused me of indecision. I think it is simply a lack of visualization and thoughtfulness on their part. These are the kind of people who plunge in where angels fear to tread--often with catastrophic consequences. Then there are the people who say that I am too decisive, too aggressive in making decisions. It is a hard thing to do. Being president of ALCOR, or any cryonics organization for that matter, goes beyond responsibility. With responsibility in a job or in almost any other field of endeavor there are guidelines, standards, your role is defined and there are plenty of precedents to guide you. In cryonics, a position of leadership is a blank check on all your resources, on your very soul. I cannot say how hard a thing it is to do.

Then why do you do it?

Because I want to live. Because no one else is doing it. Because I believe it is essential for me to do if I am to survive.

It's that simple?

No, it is never that simple. I am a human being, with all the ego, drive and "petty" motivations that human beings have. But I think it necessary to point out that I could take those drives and ego demands elsewhere and probably get a lot more satisfaction a lot quicker.

What are ALCOR's objectives?

To keep our people in suspension. Above all to keep our people in suspension. Everything is secondary to keeping our people in suspension. Beyond that to conduct research which will hopefully bring us to the point where we have true suspended animation. Of course, we also need to grow. The ultimate answer to the problem of the resource pie is to "make more." Finding out how to do that is a vitally important long term objective.

How will you do that?

Any way we can!

Any way you can?

Yes. Period.

That might take guts.

Probably.

What about the other groups, what about the duplication of resources they and you represent to each other, the inefficiencies?

Well, there are inefficiencies, but at this point the different groups represent a real difference in philosophical approaches. These differences are not just going to go quietly away. We aren't all going to sit down and pat each other on the back and smile our problems away. Given these big philosophical differences I think the situation will be continue as it has for a while.

What philosophical differences?

Neuro vs. whole-body, profit vs. nonprofit, utility company vs. mutual aid organization. Differences such as how to spend money, how to accumulate money, what constitutes a worthwhile research objective, how to conduct marketing. Strong egos are another problem. None of these things is going to be resolved easily. More likely they will be resolved by successful competition. By making a lot of the right decisions. By luck.

In what ways do you think competition will occur?

Many, probably the most critical ways, are ones we don't yet understand. Certainly the issue of HOW the service is delivered is going to be a critical one. Is it going to be a product, like any other product, or is cryonics something more?

What are your thoughts on the matter?

I believe the approach ALCOR is taking is the correct one. I believe that there are missing ingredients in the approach being used by for-profit companies and individuals who want to establish their own arrangements/trusts independent of a cryonics organization. The missing ingredients are flexibility and dedication. The type of linear, one dimensional thinking, which commercial firms and individuals have used in setting up their arrangements is simply not going to work long term. If A then B typifies their approach. Cryonics is too young for that kind of approach. It needs something more vital, more aggressive. Most intelligent people can look at the Federal Deficit and third world debt and realize that over the long term, those things mean trouble. You could buy a million dollars worth of life insurance today and not have enough money for a down payment on your suspension in twenty years. People have pointed this out to me over and over again. Simple, linear mechanisms won't work in a complex and volatile situation. The world is a hard place and there are going to be plenty of people who want to do us harm. The recent attempt by the California Cemetery Board to put us out of business was merely a harbinger of what is to come. Of course the big risk isn't organized resistance, but just

indifference. Being autopsied, being handled by a non-cooperative hospital... No one will look out for our interests unless we look out for each other.

We have to have an organization which is committed to keeping people frozen and getting them frozen and is willing to do whatever it takes to achieve those ends. That is why ALCOR has been so tough, or "ruthless" as some of our critics have said, about keeping our financial minimums high and absolutely, positively NO exceptions to requiring an automatic conversion to neuropreservation should the need arise. Using volunteer labor where we can get it, and otherwise reducing expenses is another critical element of the program. This is also why we are bringing all phases of cryonics operations under our own control. We want to be able to act, and act quickly, in any situation. We also want to be able to cut the terms under which we accept people into the suspension program. There is real leverage to be had in that area. There are more coins to pay in than the coin of the realm!

How does ALCOR plan to cope with the effects of inflation on suspension costs and on the donor trust fund?

That's the other half of the point I was trying to make. The trust funds just get eaten up. You can use gold and other speculative mechanisms in the short term to hold value, but long term these things don't hold up. They certainly don't produce wealth. The use of normal financial mechanisms to hold value will not work. This is happening already. Other groups are experiencing this problem and are agonizing, pretty ineffectively I might add, over what to do. Well, damn it, you do what you have to do and you can't be weak-kneed or faint-hearted about it. You get yourself in a position where you can convert patients to neuropreservation if they are whole-body, and you start accumulating cash and any other assets you can lay your hands on to supplement the donor fund. ALCOR has set up a system whereby ten percent of our income is diverted to the donor fund to help cope with the ravages of inflation and the uncertainty of the future. We know we are going to need those extra reserves. Any way you cut it, the donor fund can't have too much money in it.

This is the kind of extra, deep concern commercial firms simply haven't been able to show. Believe me, when the money runs out with Trans Time, they are going to pull you out and burn or bury you. They are not equipped to do anything else. They were not structured that way. This isn't to say that you aren't getting what you pay for with Trans Time. Quite the reverse. Those people who decide to go with the mutual aid keep-everyone-frozen-regardless approach offered by ALCOR will have to pay for it too. Pay for it by becoming more involved and in the long run by paying higher dues. Some people who want extra commitment from ALCOR will have to pay in ways even more costly. No one who joins ALCOR should think they are going to get a free ride. Believe me, they will wake up to some very unpleasant surprises if that is what they have in mind.

What kind of extra commitment are you referring to?

There are risks which all of us are exposed to which seem insurmountable. Being thawed out because your trust fund is exhausted is just one of many. I think all of us can imagine a great many more. Maybe there are ways to deal with those kinds of things. We're giving that a great deal of thought.

Like being autopsied?

Yes, that's a big one.

What do you think the chances of cryonics and life extension being widespread and successful in your lifetime are?

Unknown. How long have I got to live? Once again, using those oft used words, "long term", the big prerequisite is civilization surviving. If that happens, then I think that significant and even indefinite extension of the lifespan is inevitable. Widespread acceptance of cryonics also seems likely if we take such an optimistic view of the future.

Of course, I'm speaking only of the physical technology for these things. The situation is actually a good deal more complicated than that. It is probably worth considering that human beings weren't built for immortality. In fact, it seems to be quite the reverse. Vast extension of the lifespan or "immortality" will simply not "work" for the majority of people. That kind of development is what I call a "phase change." It is like the introduction of language or tools. It is pivotal, of immense significance, as dramatic as a supercooled liquid being seeded and flashing over into ice. It will be devastating for most people confronted with it. Most people don't know what to do with the life they have now. Certainly they aren't willing to fight for it. We still haven't recovered from a relatively minor recent change: the huge increase in personal wealth which the Western world has experienced. I think the example of the increase in personal wealth is a good one to illustrate what will happen when people find huge increases in life span available to them.

In what way do you think people have trouble with the "wealth revolution"?

Look at the dismal things most people do with money when they have more than enough to survive on. Look at the things this society values, puts status on: face paints, suntans, the ability NOT to be productive. We don't live in a society where status is achieved on the basis of skill or intellect or competence. Rather, we are impressed by a Cartier watch or Gucci shoes. Not to have to work or be productive is the aspiration of a huge segment of the population. The misuse of machines is another symptom of this disease. If you ask almost anyone what the purpose of a machine is, they will answer that it is a labor saving device, something to do work for you. Actually, the purpose of machines is to allow people to do MORE work, to be more productive, to extend their grasp and control over the world around them and thus increase their likelihood of survival. Any other attitude is a ticket to self destruction.

Only a very few people can deal with wealth in a constructive way. For most it kills ambition, and allows indulgence in self destructive behavior. For most people it IS possible to be too rich.

How do you know if you can be too rich? Doesn't everyone have their limit?

No, some people have no limit on the amount of wealth they can absorb and use productively. They are the true immortals because they are like sturgeon or redwoods; they will always use new resources to grow, expand and develop.

Actually, there is a rather simple test you can do on someone to determine if they have got what it takes. You ask them how they would spend blocks of money starting with say, ten million dollars and going up to a virtually unlimited amount. Some people will respond like Elvis Presley. They will be quite limited in how they can spend their money and it will come down to more and more and more of what they already have and understand until they choke to death on it. When you reach the point, as Presley did, where you are covered with rhinestones, your furniture is covered with rhinestones and you can think

of nothing better to do than send yourself and your private jet hurling across a continent for a peanut butter and jelly sandwich in the middle of the night, then you have too much wealth. For the Presley type of character great amounts of wealth are a virtual assurance of total dissolution and self destruction.

If you give the average cryonicist "X" number of dollars his first priority would be cryonics and life extension. Beyond that, the colonization of space or nuclear fusion or some other vital, life-sustaining technology. A vastly larger amount of money and things like Dyson spheres, interstellar colonization and similar ventures come to mind. With the ultimate resource tab, the ultimate quest comes to mind: total control of the universe and total understanding of it. That's the difference between the real have's and have not's.

So, you think very few people will make it to the "immortal superman" phase?

Very few. For most, immortality will be a death sentence. Indeed, it will kill them in a way more complete than death ever could, because it will eliminate them as a type, as a class. It will mean extinction of a whole subspecies of human. Quite an irony isn't it; people choking to death on life, overdosing on it, dying from too much life! And yet, I feel very sure it will happen. We simply aren't engineered for forever. Only those people willing to take the reins of destiny in their own hands and reshape themselves will be able to make it. Of course, that presupposes that the essential ingredients for survival were there to begin with: flexibility and adaptability.

Are those the only ingredients required?

No, just two of the most important ones. We'll have to make a lot of right decisions. No doubt huge amounts of research at unthinkable expense will be done to establish what those decisions are. Fools will rush in—and perish. Once true control over the parameters of self, both biological and psychological, become available I expect to see an explosion of diversity. It will be like the social experimentation which has been going on by humans for a long, long time. It will come as a logical extension of the experimenting one does in deciding one's behavior patterns, beliefs and so on. But it will be much, much more powerful, because whereas right now we are stuck with the hardware we are born with, the future will place no such limits. It will be a real three ring circus. I can't wait!

But aren't you afraid, aren't you concerned you won't make the right decisions?

Sure, but then I'm afraid now from time to time. I might make a bad decision and end up dead twenty minutes from now. What's the difference? The point is, the number of choices goes up. I'll get to have more control over how the hand is dealt.

Why do you think immortality will be good for you and for so few others?

The point of all this discussion is that most people don't know what to do with a rainy Sunday afternoon. Their values are corrupt and self destructive and I do not believe they have the will it takes to survive really long term. Immortality will be lost on them. I'm trying to point out that even people who will do well with long lifespans will be forced to reconfigure themselves to cope with it. It will take an absolute thirst to survive—and thus make the right decisions. Successful strategies for survival will probably not be straightforward; life is subtle and complex. In the long run the only answer to

the question of which approach is best will be to try them and see. If you wake up and you're still there that's usually a good sign.

What makes life good for you?

Thinking of something new, creating things, savoring the implications of a new idea, the taste of fresh picked strawberries, ice cream, listening to Rhapsody in Blue, the smell of jasmine on a cool Los Angeles wind, looking up at stars glittering with promise, the sweet glow of exhaustion after a 10K run, feeling the love and respect of friends I love and admire, a rare steak, watching my snake strike and eat, watching the sunrise, tasting the promise of an endless string of tomorrows and knowing the value I place on such promise is infinite, being told by someone who's judgement I value that I am a ruthless monster.

You are a ruthless monster.

Thank you.



A WORD ABOUT THE LAKE TAHOE FESTIVAL

Another year has gone by and it is once again time to start making plans for the annual "cryonics conference" hosted at Lake Tahoe by Fred and Linda Chamberlain. For those of you who are new to cryonics or who have never had an opportunity to attend one of the Tahoe get-togethers I can only say: plan to make it this year!

The Lake has many, many wonderful things to offer, and as usual our hosts, Fred and Linda Chamberlain, have come up with a winning bill of recreational fare. There will be horseback riding, sailing and an outdoor barbecue. This year I hope to take advantage of ALL those things. Last year, I missed out on all the "mad-moments" sitting around preparing for the technical sessions. But not this year! There will only be one day of technical sessions (and I for one already know pretty much what I'm going to say) and two days of vacation fun. So, there should be plenty of time for people to get together informally and enjoy the scenery and the good company.

For those who are interested primarily in technical matters, this year promises to be an outstanding one. There are a number of papers scheduled which represent a year's worth of good scientific progress. The quality of the technical presentations looks like it will be at an all time high—even though the total number of papers to be presented is less than last year.

So, if you want a chance to meet with some kindred spirits as well as find out what's really happening in cryonics, then fill out the Registration Form in the center of CRYONICS and get yourself to Lake Tahoe in May! —M.D.

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