

# CRYONICS

Issue No. 22

Maat

May 1982

## Contents:

Cryonics News Briefs . . . . .	page 1
Letters to the Editors . . . . .	page 2
More on Faith . . . . .	page 3
Progress in Florida . . . . .	page 5
Science Notes . . . . .	page 7
Donaldson's Science Reports . . . . .	page 8
Trans Time Enters Computer Age . . . . .	page 15
How Ayn Rand Didn't Get Frozen . . . . .	page 17

CRYONICS is the newsletter of the Institute for Advanced Biological Studies, Inc. Edited by Michael Darwin and Stephen Bridge. Published monthly. Free to members of IABS and the Alcor Life Extension Foundation. Individual subscriptions \$15.00 per year. Group rates available on request. Please address all editorial correspondence to IABS, Inc., 4030 North Palm #304, Fullerton, CA 92635 or phone (714) 990-6551.

Contents copyright 1982 by Institute for Advanced Biological Studies, Inc. except where otherwise noted. All rights reserved

Editorial Matters

IABS has recieved a number of complaints and statements about the actions of the Bay Area Cryonics Society Board of Governors with respect to subscriptions to cryonics for BACS members. While we appreciate the support being shown, we would like to point out that the people to contact are the BACS governors.

Trans Time Celebrates

Trans Time recently celebrated its 10th anniversary at its annual stockholders meeting on Sunday April 25. The anniversary meeting was the occasion of much additional good news beyond the milestone of slugging it out for 10 long years. Trans Time recently settled its lawsuit against a television station out of court for the handsome sum of \$12,500. The bad news is that the two attorneys who handled the suit will collect half of the settlement.

There was also the announcement that OMNI magazine will be printing the following retraction in one of its forthcoming issues:

"Premature Thaw," a story in the December's Antimatter section, stated that the Cryonics Society of California was located in Berkeley. We were wrong -- it was founded in 1966 in Los Angeles and has no relation to cryonics organizations in or near Berkeley."

This was in response to threat of litigation by Trans Time for the very misleading piece in OMNI which implied that Trans Time was responsible for the Nelson debacle and that cryonics was now a "dead" issue simply because one man and one organization were incompetent.

The annual stockholders meeting was attended by about 20 people and the event was capped by a large spread of food and champagne. The centerpiece of the feast was a cake bearing the inscription: "Trans Timers Keep it Up Forever 1972--1982-- w. For those of you who are not mathematically inclined the w or omega is the smallest possible transfinite number...the next best thing to being there.

Cryonics Conference?????

So far we have recieved virtually no written communications about the desirability of a cryonics conference in Southern California, excepting the letter from Saul Kent published elsewhere in this issue. We understand most of the directors of Trans Time would be willing to pay a registration fee and to attend. We urge anyone interested in attending assisting with or organizing such a conference to contact IABS, preferably in writing, before the end of May.

A Word of Praise

Sometimes one of the most trying and difficult things about being a cryonicist is the feeling of impotence we sometimes experience when subjected to abuse by the media. It is probably no secret to most long-time cryonicists that cryonics has been exploited by the media in the most ruthless and cheap way. Certainly the benefit which has accrued to media people from prying into our lives and activities far outweighs any return that has come our

way from the by and large shabby things they have said and written about us. All through this abuse we have taken for granted that there was nothing we could do about it. In order to grow we've told ourselves, we have to suffer abuses. In any event, no matter how outrageous or unjust the insult in the past, we have assumed we lacked the resources or skill to do anything other than cry into our milk about it.

Trans Time has demonstrated this isn't necessarily so. What we have been shown is that abuse requires the consent of the victim in most instances and that an unconsenting victim can cause a lot of grief. Indeed, an unconsenting victim can make a handsome haul of money on damages; in or out of court. Trans Time's fine example in pursuing litigation should give us all fine example and pause for thought when we feel we have been unjustly abused by the media. At very least a few \$12,500 settlements now then will provide some much needed additional revenue. At best, such settlements may just let a few media people know that not only don't we have any intention of dying; we also don't have any intention of rolling over and playing dead either.

#### Letters to the Editors

Dear Editors,

In Bob Ettinger's reply to my letter questioning the adequacy of Cryonic Institute's (CI) suspension program, he asserts that CI "offers the best buy and the best bet around." Unfortunately, he fails to provide evidence for this assertion.

It's time for CI to tell the rest of the cryonics community exactly how they intend to freeze and store people for \$28,000. I think the proposed cryonics conference in Los Angeles on Labor Day weekend would be a good occasion for CI to present such data.

I therefore propose that representatives of all currently active cryonics organizations contribute to a free and open debate on "The Cost of Cryonics" at such a conference. The transcript of this debate could be printed both in CRYONICS and in THE IMMORTALIST. Such a debate would be valuable and instructive for all concerned.

For Longer Life,  
Saul Kent  
Hollywood, Florida

Dear Mr. Michael Darwin, Readers of CRYONICS,

I would like to introduce myself. My name is Richard Moore and I read the article about you in the SAN DIEGO UNION entitled "Life After the Deep Freeze." I wrote to you and recieved copies of your magazine CRYONICS. I thought; "how interesting, and this fellow is a very young man. He sounds like a very happy young man but he is NOT happy at the idea of dying. Then I was compelled to write you and the many readers of your magazine who no doubt feel the despair that you do. I know someone who died once and he rose again, and he is alive today after many years. The difference is that the life of this One was given for Michael Darwin. I know that you would like to live forever. Since you are someone who looks deeply into things here are some thoughts for you to ponder:

St. Luke 20:36 - Neither can they die anymore: for they are equal unto the angels; and they are the children of God being the children of the resurrection.

St. John 12:24 - He that loveth his life shall loose it; and he that hateth his life in this world shall keep it unto life eternal.

Romans 14:9 - For to this end Christ both died, and rose, and revived, that he might Lord both of the dead and the living.

Please, consider these words from Christ Our Savior. Know that if you but get down on your knees and REPENT you shall not die.

St. John 11:26 - And whosoever liveth and believeth in me shall NEVER DIE.

REPENT!

REPENT!

REPENT!

### More on Faith From Another Source

"Our lives and powers are limited, our scope in space and time is limited, and it is not unreasonable that for fundamental beliefs we must go outside the sphere of reason and set our feet upon Faith. Implicit in all such speculations as this is a quite definite and arbitrary belief, and that belief is that neither humanity nor in truth any individual human being is living its life in vain. And it is entirely by an act of faith that we must rule out of our forecasts certain possibilities, certain things that one may consider improbable and against the chances, but that no one upon scientific grounds can call impossible. One must admit that it is impossible to show why certain things should not utterly destroy and end the entire human race and story, why night should not presently come down and make all our dreams and efforts vain. It is conceivable, for example, that some great unexpected mass of matter should presently rush upon us out of space, whirl sun and planets aside like dead leaves before a breeze, and collide with and utterly destroy every spark of life upon this earth. So far as positive human knowledge goes this is a conceivably possible thing. There is nothing in science to show why such a thing should not be. It is conceivable, too, that some pestilence may presently appear, some new disease, that will destroy, not 10 or 15 or 20 per cent. of earth's inhabitants as pestilences have done in the past, but 100 per cent., and so end our race. No one, speaking from scientific grounds alone, can say - that cannot be. And finally there is reasonable certainty that this sun of ours must some day radiate itself towards extinction; that at least must happen, it will grow cooler and cooler, and its planets will rotate ever more sluggishly until someday this earth of ours, tideless and slow moving, will be dead and frozen, and all that has lived upon it will be frozen out and done with. There surely man must end. That of all such nightmares is the most insistently convincing.

And yet one doesn't believe it.

At least I do not. And I do not believe in these things because I have come to believe in certain other things, - in the coherency and purpose of the world and in the greatness of human destiny. Worlds may freeze and suns may perish, but there stirs something within us now that can never die again.

Do not misunderstand me when I speak of the greatness of human destiny.

If I may speak to you quite openly, I will confess that, considered as a final product, I do not think very much of myself or (saving your presence) my fellow creatures. I do not think I could possibly join in the worship of humanity with any gravity or sincerity. Think of it. Think of the positive facts. There are surely moods for all of us when one can feel Swift's amazement that such a being should deal in pride. There are moods when one can join in the laughter of Democritus; and they would come oftener were not the spectacle of human littleness so abundantly shot with pain. But it is not only with pain that the world is shot - it is shot with promise. Small as our vanity and carnality makes us, there has been a day of still smaller things. It is the long ascent of the past that gives the lie to our despair. We know that all the blood and passion of our life was represented in the Carboniferous time by something-something perhaps, cold-blooded and with clammy skin, that lurked between air and water, and fled before the giant amphibia of those days.

For all the folly, blindness and pain of our lives, we have come some way from that. And the distance we have travelled gives us some earnest of the way we have yet to go.

Why should things cease at man? Why should not this rising curve rise yet more steeply and swiftly? There are many things to suggest that we are now in a phase of rapid and unprecedented development. The conditions under which men live are changing with an ever increasing rapidity, and, so far as our knowledge goes, no sort of creatures have ever lived under changing conditions without undergoing the profoundest changes themselves. In the past century there was more change in the condition of human life than there had been in the previous thousand years. A hundred years ago inventors and investigators were rare, scattered men, and now invention and inquiry is the work of an organized army. This century will see changes that will dwarf those of the 19th century as those of the 19th dwarf those of the 18th. One can see no sign anywhere that this rush of change will be over presently, that the positivist dream of a social reconstruction and of a new static culture phase will ever be realized. Human society never has been quite static, and it will presently cease to attempt to be static. Everything seems pointing to the belief that we are entering upon a progress that will go on, with an ever-widening and ever more confident stride, for ever. The re-organization of society that is going on now beneath the traditional appearance of things is a kinetic reorganization. We are getting into marching order. We have struck our camp forever and we are out upon the roads.

We are in the beginning of the greatest change that humanity has ever undergone. There is no shock, no epoch-making incident-but then there is no shock at a cloudy daybreak. At no point can we say, here it commences, now, last minute was night and this is morning. But insensibly we are in the day. If we care to look we can foresee growing knowledge, growing order, and presently a deliberate improvement in the blood and character of the race. And what we can see and imagine gives us a measure and gives us faith for what surpasses the imagination.

It is possible to believe that all the past is but the beginning of a beginning, and that all that is and has been is but the twilight of dawn. It is possible to believe that all the human mind has ever accomplished is but the dream before the awakening. We cannot see,



there is no need for us to see, what this world will be like when the day has fully come. We are creatures of the twilight. But it is of our race and lineage that minds will spring, that will reach back to us in our littleness to know us better than we know ourselves, and that will reach forward fearlessly to comprehend this future that defeats our eyes. All this world is heavy with the promise of greater things, and a day will come, one day in the unending succession of days, when beings, beings who are now latent in our thoughts and hidden in our loins, shall stand upon this earth as one stands upon a footstool, and shall laugh and reach out their hands amidst the stars."

Excerpted from a discourse delivered at the Royal Institution on Friday, January 24, 1902 by Mr. H. G. Wells.

"Suspended animation will permit the conquest of time. Coupled with success in control of biological aging, it would give man the added years of youth to realize his most ambitious dreams and to achieve an education beyond the scope of any degree of learning possible today. If the conquest of these biological barriers is the key to unlimited human knowledge, then it will also allow all of man's reasonable expectations of science to be achieved: the control of unlimited sources of energy and raw materials, the discovery and colonization of planets circling distant stars, and the transformation of our society from a pattern of war and struggle to an era of utopian peace. Most important of all men would have adequate time to strive to uncover the secrets of the natural universe and incorporate them into a philosophy that could serve as a foundation for a civilization of never-ending progress.

Robert W. Prehoda  
Suspended Animation, Chilton Books, 1969.

### Progress in Florida

We have recieved some news notes from Bill Faloon, Executive Director of the Cryonics Society of South Florida (CSSF). There appears to have been much cryonics and other life extension related activity in South Florida in recent months.

Howard Weise, director of CSSF's suspension team reported that Hollywood Health Services, a contract company upon which CSSF relies for providing suspension services, has acquired virtually all the equipment needed to perform a state of the art cryonic suspension. Training sessions for the suspension team are to be held over the summer months with personnel from Cryovita Labs likely to be present to evaluate and assist with progress.

Two of the guests at the meeting was Mr. and Mrs. Joe Cannon; both long-time cryonicists. Mr. Cannon reported on his efforts of the last 12 years to establish a long term storage facility in rural Wisconsin. The facility is to be situated on a 30 acre, state liscenced cemetery owned by Mr. Cannon. The cemetery is to be set up as a nonprofit association and is to be provided with sufficient funding to pay a board of nine directors to administer the maintainence of cryonic suspension patients. The cemetery is to be used exclusively

for cryonics purposes. Mr. Cannon has long advocated the idea that successful long-term storage of suspension patients can be carried out only with state approval in a state licensed cemetery.

The editors of CRYONICS are unclear as to whether the laws of Wisconsin would place such a cemetery operation under the control of the state cemetery board. Such a situation would be one fraught with great potential for harm to the stability of the storage facility. An unsympathetic cemetery board could virtually close down operations - very much as they tried, unsuccessfully, to do here in California.

Another concern is that Mr. Cannon does not provide a target date for completion and licensing of the facility. Also of interest would be information relating to the physical configuration of the structure, and the presence of safety features such as adequate patient exits via large, overhead doors, and an automatic fire sprinkler system. This latter consideration is an especially important one in rural areas which are frequently remote from high quality, well trained fire department personnel. We would be very interested in updated information from Mr. Cannon. Last we heard of his efforts was a piece in CRYONICS REPORTS published some eight or ten years ago. At that time Mr. Cannon reported that he had constructed a facility which consisted of a ranch style house with a full basement on 30 acres of cornfield. Such a facility would not allow for storage of whole body patients in MVE type upright dewars. These dewars have so far been found to be the only reliable, economical and safe way to maintain whole body patients. In the event of a vacuum failure quick access to the patient is needed and this requires an upright, open mouth design. A corollary of this design feature is a facility with a large amount of overhead space.

On the same note, it was also reported by Bill Faloon that CSSF will pursue the acquisition of its own storage facility once they have achieved full suspension capability. At this rate there will soon be more storage facilities than there are patients.

Saul Kent reports outstanding growth for the Life Extension Foundation of which he is the President. Total subscribers to the Foundation's newsletter Anti-Aging News now number over 2,000. The Foundation's mailing list has also grown to include over 17,000 people. The Foundation recently began marketing three products; Cognitex, a choline, pantothenic acid, RNA mixture for "memory problems," Cysteine, an antioxidant amino acid reported of use in extending the lifespan of experimental animals, and GH3, a procaine compound sold widely outside of the United States as a treatment for the aging process and age associated depression in humans. According to Saul, revenues generated from these sales will be applied towards funding research into suspended animation and gerontology.

Saul also has plans for a new radio series to be entitled Life Extension Reports. The series will follow the format of "Earth News Radio" and similar short spot shows. Each show will consist of a one and a half minute tape which will conclude with an offer to send a transcript of the show for \$1.00. Requests for transcripts are expected to generate a large number of leads for the Foundation.

Anyone wishing additional information about CSSF or the Life Extension Foundation should write:

Cryonics Society of South Florida  
6570 S.W. 47th Court  
Davie, Florida 33314

Life Extension Foundation  
2835 Hollywood Blvd.  
Hollywood, Fl. 33020

SCIENCE NOTES

by Hugh Hixon, Jr.

Frog Freezing Nature's Way

Where do non-aquatic frogs go when winter comes? Aquatic frogs burrow into the mud below the frost line and hibernate. But tree frogs? William D. Schmidt of the University of Minnesota, writing in Science (215, 1982, p.697-8), found that they burrow under leaf litter and freeze--somewhat. Measurement of the temperature of this microclimate determined that it never dropped below  $-7.2^{\circ}\text{C}$  in the 1980-81 winter. Analysis of frog urine and muscle tissue revealed that all samples contained 0.3M (2.8%) glycerol. This allowed about 34% of the frog's body water to freeze at  $-6^{\circ}\text{C}$ , the remainder staying liquid at that temperature. This protective mechanism was found in three different species of terrestrial frogs, but not in two other species of aquatic frogs, which have a different protection strategy.

To test the limits of glycerol protection, three specimens of one species were cooled to  $-30^{\circ}\text{C}$ . None survived. Specimens kept for 5-7 days in the range of  $-4^{\circ}$  to  $-9^{\circ}\text{C}$  showed no vital signs until they had been thawed out and held 2 to 4 days at  $4^{\circ}$  to  $8^{\circ}\text{C}$ . The author did not determine whether or not the frogs could survive more than two freeze-thaw cycles nor what the actual minimum survival temperature was. The size of the frogs was not given. It was noted that frogs of the same species did not have glycerol present when they were tested during the summer months.

Embryo Storage Uproar

The technology for handling human embryos is about to take another step, and as usual the ranks of the godly are somewhat disturbed. A recent Associated Press release covered the announcement by test-tube baby pioneers Edwards and Steptoe that they will begin to store frozen human embryos. The "spare" embryos are a side effect of their technique for fertilization of human egg cells outside the mother's body. This involves triggering the mother's ovaries chemically to release a large number of eggs at once, which are then removed surgically and fertilized in vitro. Two viable fertilized eggs are then implanted in the mother's uterus. This technique of multiple fertilization is required in order to insure that viable eggs will result from a single operation. Human eggs are subjected to rather severe biochemical editing, with only 30% of all conceptions resulting in births. By having a number of fertilized eggs to monitor, Edwards and Steptoe are able to implant two embryos which have passed the initial natural selection. However, more than two embryos may survive to the implantation stage. The researchers intend to freeze the extra embryos so that the mother may be reimplemented if there are complications in the first pregnancy or if additional children are wanted. This still may leave extra embryos. Edwards and Steptoe propose, with the genetic parents' permission, to donate the embryos to women whose fallopian tubes are damaged and who thus cannot conceive even with The Edwards-Steptoe methods. There should be little difficulty in recovering frozen embryos in a viable state. In use with mice embryos, freezing, storage in  $\text{LN}_2$ , and



thawing results in recovery rates as high as 85%.

The ethics committee of the British Medical Association and the British anti-abortion pressure group, Life, denounced the plan immediately, pointing out "horrendous legal and moral complications. What is the legal status of a child conceived in this way?" Once again science has moved into an area previously regulated by law and custom. And as usual the ethicists, moral regulators, and legalists found themselves looking like asses in places they didn't even know existed. It should be admitted that there are a whole raft of interesting questions to stumble over. What is the legal status of a frozen embryo? Is it a person or a piece of property? Is it alive or dead? The answer to these two questions is of major importance to cryonicists who may find themselves in the company of the right-to-lifers on this particular question. If the embryo is donated, may the child be reclaimed from the host parents? This has been the case in at least one suit brought to reverse adoption proceedings. If the host parents don't like "their" child, can the transplantation be used as grounds for some form of disinheritance? If the genetic parents can produce a fertilized egg, but the mother cannot accept the embryo and carry it to term, so instead a host mother is employed, whose child is it? In a case last year where a couple employed a host mother to bear a child whose genetic make-up was father and host mother, a civil contract had been made that the resulting child was to be relinquished to the father and his wife. In this case the host mother reneged on the contract, had it broken in court and kept the child. Etc., etc.... Stay tuned for future developments.

#### SCIENCE REPORTS by Thomas Donaldson, Ph.D.

##### MORE EVIDENCE FOR A CENTRAL BRAIN CLOCK (OF AGING?)

As readers may know, all our physiological and behavioral rhythms seem to depend on several different brain clocks, which control our cycle of sleep and waking, the times at which we eat, and many other hormonal or physiological rhythms which we do not directly perceive. Only a few years ago, scientists learned that one particular brain region seems to act as a central clock (B. Rusak et al, PHYSIOLOGICAL REVIEWS (1979) 449). This brain region is the suprachiasmatic nucleus. (SCN). The first evidence for the involvement of the suprachiasmatic nucleus came from studies in rats in which this region was destroyed; the normal rhythms of the rat were disrupted. This disruption did not involve so much a complete loss of rhythm, since there seem to be several other clocks which control particular classes of hormonal or behavioral cycles; what happens instead is that the separate rhythms all go out of phase with one another and become disorganized, so that the suprachiasmatic nucleus seems to act as a central clock to which all the others are set.

The authors of a recent interesting paper in SCIENCE (215 (1982) 1407; B. Rusak et al) observed that present evidence doesn't directly show that the SCN is a central pacemaker, but only that its destruction impairs central pacemaking. They set out to produce some more direct evidence by implanting electrodes into the SCN of hamsters and rats and stimulating their SCN electrically. They found that electrical stimulation will indeed cause shifts in the phase of daily cycling in their experimental animals. Backward shifts seemed very difficult to produce, but forward shifts were much easier. The patterns of forward or backward shifts resembled closely the same sort of shifts produced by sudden exposure of a light-deprived animal to a single light pulse; the authors also planted electrodes in brain regions nearby as controls in rats, but found no phase shifts.

The notion that there might be some clock of aging has gotten too much lip service and not enough action: we would expect that any clock of aging would relate closely to other clocking behavior in our brains, and that by identifying clocks and modifying their clocking we might expect to modify aging. One good place to start such a study might be ovulation in female rats, mice, or other rodents, since it begins at a specific time in development and shows a definite clocking. A recent paper by CH Anderson in *EXPERIMENTAL NEUROLOGY* (74 (1981) 780) has just done exactly that. Anderson observed that the size of the nucleolus, a cell organelle present in all cells, would correlate to whether or not the cell in question was actively producing protein and thus whether or not it had begun increased metabolism. He therefore set out to study the size of the nucleoli of neurons in various regions of the brain of female rats as they pass through puberty. The supposition would be that whatever brain regions are involved in causing the changes of puberty would start increased metabolism exactly when puberty begins.

Anderson examined both the neurons in the medial preoptic area (POA) and in the suprachiasmatic nucleus (SCN) of female rats, and also in the caudate nucleus (apparently as a control). At the time of puberty, Anderson's female rats showed considerable increases in size of the nucleolus of the neurons in both the POA and the SCN, but not in the caudate nucleus; evidence from other experiments supports the idea that this change means that puberty coincides with increases in the metabolic activity of the SCN and the POA.

Connections between puberty and aging may seem arcane until we reflect that both processes are cases of developmental change which may very well be mediated by the same clock; that in addition the SCN was already known to control clocking, and that finally the preoptic area would be involved in clock cycling because this cycling generally matches in phase the day-night cycle as seen by the rat.

As yet gerontologists have given their attention to much more indirect measures of the passage of time which may cause aging. For instance, one popular theory of the endocrinology of aging suggests that through hormonal feedback processes aging occurs as a sort of "runaway cascade" effect. However the decrease in function which occurs with aging seems to follow a constant rate, and it is hard to see how such a "runaway cascade" could produce a constant rate of decrease in functional capacity. Close attention to aging clocks may give someday a much more primary explanation.



Cryovita Laboratories offers a full range of quality new and used instrumentation and cryonics equipment. We maintain a large selection of disposable supplies such as oxygenators, tubing, cannula, and perfusate and cryoprotective chemicals.

For additional information please contact us with your specific problem or need:

## Cryovita Laboratories

4030 N. Palm, #304  
Fullerton, California 92635  
(714) 879-0414

IMPLICATIONS OF LONGTERM DRUG EXPERIMENTS AND USE

As cryonicists know, the likely treatments for aging (and those which already exist but have not been proven) involve the longterm use of a drug or chemical as a preventative for effects which will only themselves occur after a long time. As such they give rise to risks, since NONE of the chemicals so far sued for aging has yet been tested for the whole lifespan of a human being. If we would like to gain some idea of the likely reaction of the medical community to such drugs, and the likely problems which may arise for us when we take them, we can study the effects of other drugs which are also taken on a longterm basis and the response of doctors to them.

A recent editorial in NEW ENGLAND JOURNAL OF MEDICINE (306, (1982) 297) by Michael Oliver MD gives us a capsule summary of the problems which have arisen with existing drugs for longterm use and also, in the opinions expressed by Oliver himself, a good idea of how the medical community is likely to react to such drugs.

A large number of such drugs are presently used, even if we arbitrarily exclude oral contraceptives from the list (on the ground that they are not used to treat a disease state). For instance, to control unusually high levels of cholesterol both the drugs triparanol and clofibrate have been proposed for longterm use by people who will have, not the inherited form of very high cholesterol levels, but cholesterol levels which are raised above the normal level. Triparanol has led to fat deposition in the tissues, loss of hair, and formation of cataracts; clofibrate leads to a significant increase in mortality due to diseases other than diseases of the circulatory system, in particular to increases in cancer rates. Use of the betablocker propranolol to control hypertension can cause a significant increase in disorders of the peripheral circulation. The drugs tolbutamide and phenformin, commonly given longterm to diabetics, may cause an increase in the rate of heart attacks among patients using them.

Oliver himself mumbles about the ethical problems involved with such drugs; given that informed consent is obtained I see no ethical problems, but many problems of implementation. One of the constructive comments which Oliver makes is to emphasize the necessity for longterm monitoring of patients and their records so as to judge which drugs have been taken: the longterm consumption of a drug which may increase health leads to the same problems of epidemiology as the longterm consumption of other drugs such as tobacco for purposes not directly related to health. At present even quite grave consequences of longterm drug use would be hard to discover from existing epidemiological records.

In about 1935 the British Interplanetary Society carried out a pathbreaking study in which they showed that with the technology available at that time (1935!) it would be possible to send a manned mission to the moon and back. Actual dispatch of such a mission was delayed by 35 years, as the funding agencies were gradually convinced that sending a manned mission to the moon was not only possible but worthwhile. To an immortalist, 35 years is fully half their expected lifespan. It is true that prolonged epidemiological studies will eventually allow us to conclude that some drugs are actually preventatives for aging, that equally long studies will give us increasingly better drugs, and that we can confidently expect the eventual discovery of a drug which will actually reverse aging altogether. Yet the time involved to do all these things is likely to be very great: practical problems of implementation, such as doctors face with their studies of preventatives for heart disease, are likely to delay final acceptance of a drug for long past the time at which we need it for ourselves.

AGING AND HIBERNATION AND SERENDIPITY

A large number of scientists interested in hibernation have speculated that there must exist some hormonal substance produced by hibernating animals which causes them to go into hibernation. Animals which hibernate, both mammals and nonmammals, all can lower their metabolic rates without danger and then after their period of hibernation resume life at a normal rate; it would be useful medically for us to be able to do this in human beings.

However up to now there has been only slow progress in identifying or using such a substance, if it exists. For a long time hibernation studies supposed that some substance in the brown fat (a kind of fat which infants and hibernating mammals both have) would cause hibernation, but that line of work lead nowhere. More recently, AR Dawe and others have been able to cause hibernating animals to commence hibernation, regardless of the season, by injecting them with serum from animals which were in hibernation (cf LCH Wang, JW Hudson (ed) STRATEGIES IN COLD, NATURAL TORPIDITY, AND THERMOGENESIS). H. Swan et al have also studied the effect of extracts from the brains of hibernating animals, in particular from the brain of hibernating (estivating) lungfish. They had earlier studied similar extracts from the brains of hibernating ground squirrels.

Unlike the earlier studies of serum, Swan et al have studied the effect of these extracts on animals which do not normally hibernate, specifically rats and mice. In a recent paper in CRYOBIOLOGY (18 (1981) 598) they continue these studies and show conclusively that BOTH extracts of lungfish brain and extract of ground squirrel brain will cause, not hibernation, but a reversible decrease in body temperature, in mice.

The decrease in temperature was on the order of 1 degree centigrade, not absolutely a large amount and in fact not enough to cause loss of consciousness. Even though squirrels are certainly closer to mice, it turns out the lungfish extract had a bigger effect on body temperature in the mice than did the ground squirrel extract.

In a journal devoted to immortality in two of its physical forms, one might guess that the primary interest of this study lies in its relation to hibernation and possibly suspended animation. I mention it, in fact, not because of any real prospects it suggests for suspended animation but rather for its possible relation to an apparently distant subject, aging. Even though a drop of 1 degree centigrade is useless for hibernation, a drop in metabolic rate and body temperature of 1 degree might cause a significant increase in our LONGEVITY. Readers of CRYONICS will already know of the experiments of Rosenberg at the University of Michigan with possible means of increasing lifespan by lowering body temperature, and the clear difficulty of producing such a decrease without causing other harmful effects which would negate any increases due to lowered body temperature; the substance discovered by Swan et al in brains of hibernating animals might well prove a much more effective means of lowering body temperature than other substances suggested so far.

As for hibernation, it is very hard to see how hibernating humans could be supported at temperatures above freezing for periods as long as would be needed for immortality: the physiological support needed, considering all of the problems which happen in kidney dialysis, for instance, would extend far beyond our present capabilities, possibly even farther than would be needed for us to discover immortality directly.



CAUSES AND TYPES OF INJURY IN FROZEN KIDNEYS

One of the newer and more outstanding researchers in cryobiology is Gregory M. Fahy, of the Blood Services Laboratories of the American Red Cross. Fahy has carried out an extensive study of the causes and types of injury in frozen kidneys with a view to discovering how best to preserve them. The latest paper in a series on this topic has just appeared in CRYOBIOLOGY (18 (1981) 550).

One of the most interesting observations of these studies was the possibility that DMSO directly caused injury to the kidney on freezing, rather than having a purely protective effect. In an earlier paper, Fahy has presented evidence that DMSO causes such damage to frozen rabbit kidneys (CRYOBIOLOGY 17 (1980) 371); however his previous experiments left open the possibility that the injury was really only the consequence of formation of ice inside the cells rather than outside during freezing, a kind of event known already to be quite damaging to the cells. In his most recent paper, Fahy shows quite conclusively that the injury already seen on freezing with DMSO cannot come from ice within the cells. The paper is quite thorough, using three different methods to reach that conclusion: finding the optimal cooling rate for freezing the rabbit kidneys (since ice forms inside the cells when the cooling rate is faster than optimal), slow warming to allow growth of ice crystals present already within the cell (if they already existed and grew on slow warming, we would expect slow warming to cause more injury than fast warming, and it did not), and finally actual observation of the location of the ice crystals in frozen tissue using. None of these methods revealed enough ice crystal formation within the cells to explain the loss of capacity of the rewarmed kidneys after freezing, so that the case for toxicity of DMSO seems quite clear.

Fahy also presents some other observations on freezing injury in rabbit kidneys. The most important observation concerns the actual verification of mechanical injury which happens with freezing: his freeze-substitution microscopy revealed injury to several types of cell crucial to kidney function, in particular to the glomeruli, and further injury to other cellular structures equally critical to kidney function. The glomeruli are tufts or coils of blood vessels leading into each of the microscopic tubes in the kidney which produce urine, which is collected and taken to the bladder by the ureters; glomeruli in particular seem to suffer quite massive destruction after freezing due to ice-formation.

Fahy's work is an interesting illustration of the influence of Will in science. A recent abstract by DE Pegg (Abstr 19, 18th Annual Meeting, Society for Cryobiology) on possible damage to organs at a level above the cell, so that the function of the organs is destroyed even though the individual cells are not, seems to me to come very close to admitting total defeat in the problem of kidney preservation. Fahy on the other hand has gone on from this work to investigate possible means of overcoming these problems, difficult though they may or may not be: he has suggested vitrification rather than freezing, carrying out detailed studies of how such vitrification might be obtained, and furthermore discovered that both urea and acetamide will, in the right concentrations, make DMSO almost nontoxic to kidneys (cf. CRYONICS). Continued on page 16.



RESUSCITATION ATTEMPTS IN HOSPITAL

Cryonicists have known for a long time that death in actuality is far more complex than popular myth allows. In effect, you are dead when the doctor gives up: there is no physical condition at all which automatically means that you are dead, since the question of death is almost entirely a matter of how doctors and others respond to you, it has not to do with your objective physical state. To give up involves a value judgement; whether to give up cannot follow from any physical condition alone. True, this cryonicist version of "death" conflicts with what everyone says ("He was past the 8 minute limit! What else could we do?"), but values and facts ARE separate. Reflect, after all, that if the person to be recovered were valued highly enough, even attempts to recover them from their dry bones would be made. Institutes would be endowed with the sole purpose of recreating this person, thousands of scientists would work night and day on identity reconstruction to bring them back from whatever fragments: clothing, bones, diary, old photographs, might have remained. You may agree that such vast efforts to revive someone would waste resources, but that is exactly a value judgement.

On observing actual behavior in a hospital we see how these thoughts, apparently abstract and philosophical, take on concrete form. CO Hershey and L Fisher in LANCET 2 January 1982, p. 31, have published a very interesting account of attempts to revive patients in the General Ward of Cleveland Metropolitan General Hospital for the 6 months from 1 July 1980. The General Ward of a hospital differs from the Intensive Care Ward: patients in the General Ward are receiving normal hospital care, but not the intense study of those in an IC Ward. They are often strangers to the doctors and nurses attending them, who may not have intimate knowledge of their condition and prognosis.

It is particularly interesting that over the years, cardiopulmonary resuscitation has become quite widespread in hospitals, so that almost any patient has become a candidate, regardless of their prognosis or their age. Successful resuscitation is rare; the major reason for this seems to be that so many patients from the General Ward, whose condition is already very poor and who are likely to die soon in any case, are subjected to the procedure. Hershey and Fisher studied the statistics of this process.

Of the 35 patients who underwent CPR in the General Wards, only 2 survived longterm, 1 of whom is still in the hospital months later. Hershey and Fisher found on examination of their medical records that only 4 out of these 34 patients were viable. They attempted to set up criteria for what was a "reasonable" use of CPR compared to an "unreasonable" use: only 8 separate incidents of resuscitation out of 36 (one patient has more than one CPR) qualified as "reasonable". The patient who had revived after CPR had to remain on a ventilator permanently thereafter in hospital; another who had revived had quadriplegia due to multiple sclerosis and was discharged from hospital. Four other cases of "reasonable" revivals were of neurological patients who had chronic diseases in their final stages; they were judged "reasonable" because they were fully conscious. Virtually every patient placed on a CPR in the General Ward was moved at once to the Intensive Care Unit, where after several days and the expenditure of much care they finally "died". (Hershey and Fisher even describe what happened in these "deaths": "in no case was support withdrawn from a patient; usually new developments were not responded to with increased support.").

Further examination of their statistics shows much else of great interest. In the first place, doctors do make a decision that applying CPR is "unreasonable", since during the 6 months of the study there were 60 incidents of CPR and fully 277, or more than 4 times that, number of deaths. The standard euphemism for someone whose medical records indicate they are not to be revived is "no code status", but of course not every case has such a status, even among those whose illness is terminal. But it seems that even a "no code" notation on the patient's chart is not prominently displayed, so that a doctor often applies CPR to such patients.

The most interesting statistic from the viewpoint of understanding "death" as it is now practiced is the fact that fully 28% of patients receiving CPR had been found without any vital signs (in other words, their objective condition was that of "death" normally so called). Naturally such patients went to the Intensive Card Ward with the other CPR cases. In most but not all of these cases, the patients had been found by a nurse, who at once instituted CPR. No doctor was present to carry out the ritual declaration of death, so the patient was "alive" and treated as such. It appears from reading Hershey and Fisher that although MOST such cases were instituted by nurses, SOME were not, and we would like very much to know about these cases, but Hershey and Fisher unfortunately tell us little.

Besides its interest in clarifying ritual behavior and belief regarding "death" the paper tells any cryonicist some very important things about what they must do to increase their chances of successful suspension. It appears from these statistics that fully 25% of patients in hospital undergo CPR; cryonicists should know by now that unsuccessful CPR, which fails to reestablish circulation to the brain, is catastrophic for brain preservation. Indeed, we could not be far wrong if we judged hospitals to now be malign institutions for the purpose of total destruction of brains, and the whole procedure of care of the dying to be aimed not merely at ritual declaration of death, but at guaranteeing the destruction of those who have been declared ritually dead. The paper suggests that we should attach a much higher priority to means of avoiding CPR while dying than we have so far done.

#### A NOTE OF EXPLANATION ON "RESPIRATOR BRAIN"

Some cryonicists have brought to my attention the fact that others might not understand how it can be that prolonged placement on a respirator can destroy the brain, especially in view of the fact that our bracelets specifically ask for us to be placed upon a respirator.

The subject is complex; however to summarize it briefly, if we are placed on a respirator in a hospital situation, rather than as part of cryonic suspension, our body temperature will be maintained at the normal human body temperature of 37 degrees C. If it happens that circulation to our brain is not reestablished, this will mean that our brain cells would remain deprived of oxygen and nutrients for a long time while at a high temperature. This will cause all of the deteriorations we recognize as happening with ischemia, made worse by the high temperature. After a period of about 24 hours with this treatment, very little cell structure remains in the brain. Neurologists attending patients on a respirator recognize this condition and give it the name "respirator brain".

The distinction with cryonic suspension is that, in the first place, if the suspension is planned well in advance, we know that we CAN reestablish circulation to the brain. Therefore these events, which happen when circulation is not reestablished, cannot occur. Secondly, it is part of cryonic suspension that we do not merely place the patient on an HLR, but also vigorously cool the patient. This means that all of the consequences of ischemia are quite considerably slowed by the low temperature, EVEN IF circulation to the brain is not established. We would therefore expect that respirator brain would present no problems to a patient undergoing proper cryonic suspension.

Some neurologists have argued, on the basis of experimental work with animals, that a "little bit" of recirculation is actually worse than none at all. This is a separate issue, and would be hard to apply in a clinical situation in any case.

A second issue is that of whether or not our bracelets should ask that we be both placed on an HLR and cooled. I personally believe that we would be better off to leave our bracelets as they are: if we are cooled, the problems of respirator brain should be considerably mitigated, and it is hard to see how any physicians or others would place us on an HLR (a complex and troublesome procedure) while at the same time not cooling us down (a much simpler procedure)...that is, if they pay attention to our bracelets in the first place.

### TRANS TIME JOINS THE COMPUTER REVOLUTION

Art Quaife, President

Trans Time has recently purchased a microcomputer system, with many thanks to Laurence Gale (a Trans Time Vice-President, and President of ALCOR) for acquiring and putting together the components for us at excellent prices.

Until the end of 1981, we were carrying out our accounting under the Crocker Bank computerized service. When they discontinued that service and we faced the need to transfer our accounting elsewhere, the economics of purchasing our own computer to do in-house accounting (and many other functions) became attractive.

For the information of our many computer-oriented colleagues, the system we purchased is configured as follows:

The hardware consists of a QT Computers mainframe, a Teletek CPU, 64K bytes of memory, a 12 slot motherboard, using an S-100 communications bus. It has two Qume 8" double sided double density disk drives, holding 2 Megabytes total. The terminal is a Televideo Model 950. The printer is a Diablo Model 630 daisy wheel (letter quality) printer, with a keyboard so it can be used as a typewriter or as a terminal if needed.

The software we have acquired so far consists of the CP/M operating system, WordStar as the word processing program, SpellStar thrown in as a bonus to check spelling in documents, CalcStar which is one of the family of very popular electronic spread sheet programs, and Microsoft's version of Basic, which has become the most widespread applications programming language for microcomputers.

Soon to arrive is the Peachtree general ledger program to take over our accounting. In the future we are likely to purchase other Peachtree accounting modules, such as their accounts receivable program. We will also be acquiring a mailing list program, or possibly a data-base manager.

Because of the numerous documents we prepare and continually update, with each revision formerly requiring another complete run through the typewriter, the word processing capabilities of this computer alone will substantially increase our productivity.

These are valuable and essential, but still mundane, uses of the computer. Looking to our desired extended future, the extraordinarily rapid development of computer technology holds great promise for the life extension sciences. By almost any measure (speed, size, cost) the capabilities of computers are doubling every couple of years. Never in the history of mankind has such a powerful new technology evolved so rapidly.

In trying to understand and control the myriad processes of aging, or the mechanisms of freezing damage in cryonic suspension, we are confronted with the overwhelming complexity of the human organism -- just consider the millions of reactions occurring simultaneously within even a single body cell. The current version of the human brain can formulate models which cope with only the barest subset of these processes (presumably the more important ones). But just imagine the advances in our predictive understanding if we had a machine that could solve one million chemical reaction equations simultaneously! Such computers are coming.

I conjecture that within about 40 years, the most powerful computers will be out-thinking the 1982 model of the human brain, even passing the "Turing test" in many areas of human cognition. In the interim period, genetic engineering will begin improving the human brain, and the race between these two "species" will be on. The question then, in the words of the eminent Humpty Dumpty, will be which is to be master -- that's all!

Continued from page 12.

Unfortunately, Fahy's work on kidneys has no direct implications for brain freezings. For instance, the mechanical injury Fahy finds in kidneys will have only indirect bearing on possible mechanical injury in brain tissue, which is quite different. Fahy has in fact carried out some studies of brain freezing, apparently with a view to using frozen brains as a means to study questions in neurophysiology (Abstr 24, 18th Annual Meeting, Society for Cryobiology). Preservation seems to have been good as measured in the light microscope, but we clearly need much more study of this question. Fahy's work has, on the whole, probably brought kidney freezing much closer; from this we can expect indirect benefits for brains but only indirect ones.

HOW AYN RAND DIDN'T GET FROZEN

by Michael Darwin (Federowicz)

"Since life requires a specific course of action, any other course will destroy it. A being who does not hold his own life as the motive and goal of his actions, is acting on the motive and standard of *death*. Such a being is a metaphysical monstrosity, struggling to oppose, negate, and contradict the fact of his own existence, running blindly amuck on a trail of destruction, capable of nothing but pain."

from John Galt's oath in  
Atlas Shrugged, by Ayn Rand.

On November 21st, 1981 Ayn Rand addressed the National Committee for Monetary Reform conference in New Orleans and announced that she was writing a nine hour teleplay of Atlas Shrugged. Rand stated that it was her intention to produce the mini-series herself. Less than four months later Ayn Rand, the champion of the individual, was dead at the age of 77. She left much unfinished work.

Ayn Rand did not get frozen. It certainly wasn't the case that she had not had the opportunity to hear about cryonics. In fact, we suspect that she not only knew about cryonics but that she had personally decided she didn't want it. In the early 1970's Fred and Linda Chamberlain, then running Manrise Corporation in Los Angeles, began sending Rand copies of The Hourglass (the newsletter of the Cryonics Society of California) and other cryonics literature. After several issues had been sent, The Hourglass was returned as refused. The Chamberlains followed this with a letter asking her to clarify her refusal and stating that they would remove her from the mailing list unless they heard from her. Rand never responded. It is interesting but not particularly productive to speculate about what Rand thought of cryonics. By almost all accounts Ayn Rand was not a person of great warmth or flexibility. Those who knew her say that empathy and openness were not strong elements in her character. All we can say is that every effort was made to reach her with our message and that she did not respond.

Shortly after word of her death was reported in the press, a number of individuals became involved in an attempt to reach those people surrounding Rand and persuade them to have her frozen. At the Alcor meeting the day following Rand's death, one individual began a frantic series of phone calls to attempt to make suspension arrangements for Rand. Meanwhile, up north in Berkeley, Trans Time received a few calls from one of Rand's "students" who was also attempting to persuade those surrounding Rand to arrange for her suspension. All of these attempts were unsuccessful and some were met with frank hostility by those in control of the situation in New York. None of this is surprising.

What is surprising is the character of the offers that were made to "save" Ayn Rand and more particularly the character of the people who were making them. In Los Angeles, the individual who was working to get Rand frozen stated that he could come up with a thousand dollars immediately to contribute toward her suspension. This is interesting since this individual has no suspension arrangements himself and has stated financial problems as the main obstacle to completing arrange-



ments. The student of Rand in Colorado also had no suspension arrangements and no plans to make any; in fact, she wasn't even a member of any cryonics group.

What can be said about such people and their efforts? The first thing that comes to mind is "inadequate." The time to convince ANYONE of the rationality and desirability of cryonics is when they are alive, not when they are dead. It seems certain that these well-meaning individuals felt they owed a great debt to Rand and further felt that her death represented a great personal and intellectual loss. But, as has often been said, the road to hell is paved with good intentions.

The point these people are missing is that of personal responsibility and respect for the beliefs of others. These people should understand that an intellectual or personal debt can only be repayed by diligent effort and not by ritual or by going through the motions of last-minute guilt. It takes work and risk and maybe even facing rebuffs to persuade someone like Rand to decide to be frozen. Most of all it takes courage, because the odds of success are infinitesimally low and the process of failure is likely to be painful and hard on the ego. Those who think that freezing Ayn Rand is going to be as simple as a few phone calls made 24 hours after she had died are not merely naive, they are stupid.

Perhaps a more salient observation about these would-be saviors would be about the state of their own affairs. NONE of the people scrabbling to save Ayn Rand had made the first effort toward suspension arrangements for themselves. In other words, these people didn't have the discipline, or sense of self-worth or the intelligence to save their own lives, much less someone else's. It is ironic that these people apparently do not understand the basis of the philosophy of this writer whom they profess to love and admire. If there was one message that was central to Rand's teaching, it was the sanctity of the individual. Rand taught that it was self-worth and the awareness of that worth in the form of ego that was the source of all human progress and good. As Rand would have been quick to say, the person whose life to worry about saving first is your own. These gaseous dreamers, who haven't had the good sense to put a life net under themselves first, would do well to learn what Ayn Rand was really all about. As Rand herself once said, "You can't have a pinch hitter live your life for you." Sound advice. We are sorry to have lost Ayn Rand. She was a brilliant woman to whom we will forever owe a tremendous debt of gratitude. But we have ourselves to worry about, and we know she would understand if we insist on putting that worry first.

"I swear--by my life and my love of it--that I will never live for the sake of another man, nor ask another man to live for mine."

also from John Galt's oath in Atlas Shrugged.

INSTITUTE FOR ADVANCED  
BIOLOGICAL STUDIES, INC.  
4030 North Palm #304  
Fullerton, CA 92635

TO: