

CRYONICS

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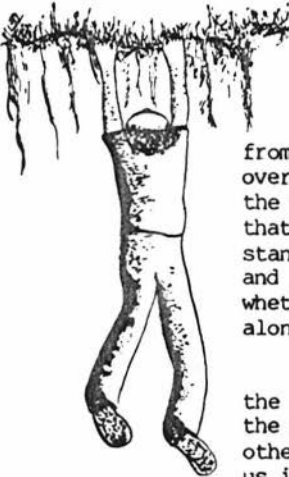
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EDITORIAL MATTERS

Last month's question column on rates of chemical reaction versus temperature managed to escape into print without an author credit. We'd like to credit co-editor Hugh Hixon for that useful information.

The Future of CRYONICS

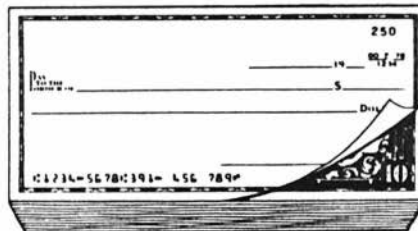
Editing CRYONICS is a satisfying and challenging undertaking. But in many ways it's a little like being in love with a movie star. You scarcely ever know how much of what you write is being read—or appreciated. We aren't professionals. We know that CRYONICS is far from perfect, but we do feel we've shown steady improvement over the years and that the magazine represents top value for the money. As we've repeatedly pointed out, the very fact that CRYONICS has been able to consistently meet the standards we've set for it is that the demand has been there and been paid for. Each year it's an open question as to whether we'll be able to continue as we have in the past, let alone grow.

Unfortunately, this year has been a pretty dismal one in the financial support department. Year end contributions for the magazine did not meet last year's outstanding high, and other cryonics groups are by and large unwilling to help us in increasing circulation among their members. There are

a number of reasons why other cryonics groups behave this way. ALCOR has been growing, growing at an unprecedented rate, and some of this growth has been at the "expense" of other cryonics groups. Additionally, we've never pulled any punches in CRYONICS. We have in the past and will continue in the future to publish controversial articles and critical essays. Some of this controversy and criticism surrounds the actions and policies of other cryonics groups.

Lest we be branded as "unfair," it should also be pointed out that we've never been shy about printing criticism of ALCOR or CRYONICS either. There are a fair number of embarrassing and often accurate and timely criticisms of our own operations in the pages of CRYONICS as well. We see that as essential to our own growth and development and to addressing areas where we aren't doing the best job that we could be.

But not everyone sees things that way. And, to be honest, there is some justice to their point of view. No one likes to be criticized, particularly when they feel they have no "control" over the criticism and particularly when the criticism appears in a "competitor's" magazine. And there is competition. There are different philosophies, different geographies and different special interests between groups. Unfortunately, there are only a limited number of people and other resources at this time—which makes for competition. We can't simply make this situation go away without someone, somewhere getting hurt. Some issues don't admit of easy compromise.



What all this boils down to is that to a great extent ALCOR is on its own in terms of building a subscriber base and in terms of getting the word out. Even though, free of charge, we run a monthly BACS/Trans Time column, neither organization will give or sell us "bad leads" (i.e., information requests they receive which they have answered with no results), nor will any other cryonics organization including CA/CI purchase group subscriptions or routinely furnish their membership with information on how to subscribe to CRYONICS. Officially, we don't exist, or we exist only by reference, in other words only by the briefest mention that we exist, but not in any concrete terms, such as how to subscribe or even where to contact us. It takes more than this, much more than this to persuade people to subscribe to a cryonics publication (or any publication for that matter).

One of the things ALCOR officers have learned the hard way is that marketing can be everything. The last couple years, and in particular the last eight months or so, have given us tremendous insight into the raw power of proper marketing. From personal experience we've found that sometimes the simplest, often the stupidest things work. Without the opportunity to put advertising information into prospective subscriber's hands, we are unlikely to sell subscriptions.

Of course, there may be other reasons why some organizations don't want CRYONICS in the hands of their members. We know of one organization which has yet to inform its membership in any systematic way that serious fracturing of suspension patients occurs with existing techniques. Another organization has chosen to convey this information in a very limited fashion, failing to document in any detail the scope of the problem (i.e., spinal cords and most major organs severed by fractures). One cryonics organization specifically forbids neuropreservation for its members (by refusing to offer the procedure or store members who might be treated elsewhere in this fashion) and has stated that they feel availability and discussion of neuropreservation are counterproductive and not in the interests of cryonics. These kinds of philosophical differences are not easily overcome and they do limit our access to other markets.

As you can see from the background sketched above, it's not easy to keep CRYONICS going. Our forthrightness (some would say malice) carries a penalty. Unless we choose to play political games by compromising our editorial standards we have little choice but to pay those penalties. Fortunately, in the past we have had the support required to make the payments.

CRYONICS has been, and will continue to be, a place where ideas, even controversial ones, can be openly discussed. Please understand that we are doing everything we can to broaden our base of support, but that we labor under great handicaps. In the meantime, the Officers and Directors of ALCOR cannot allow the production CRYONICS to slow down the pace of research or improved patient care by creating a financial drain. Thus, in view of the rather limited support for the magazine we've received we will be forced to cut back.

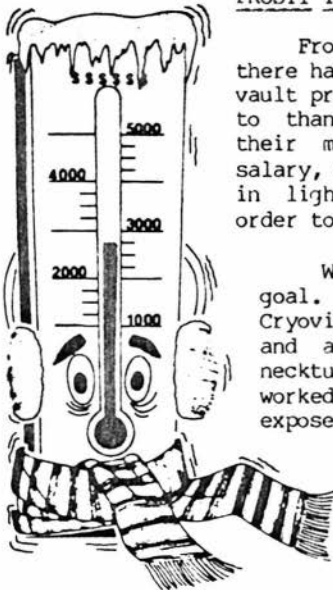
I think the editorial staff and those who have so generously contributed in the past (with both time and money) have more than fully discharged their responsibilities. Everyone has worked long and hard in the face of little positive feedback. We have done our job.

The responsibility is yours.

ALCOR TREASURER CHANGE

Bill Jameson, long-time ALCOR Treasurer, resigned his office to Sherry Cosgrove at the ALCOR Board of Directors meeting 6 January, 1984. Bill has been ALCOR Treasurer since July, 1978 and has been a perfusion team member since its organization under Jerry Leaf in 1976. Also during that time, he has undertaken several special jobs, such as overseeing the dissolution of the unsuccessful ALCOR Investment Club, in 1982-3. Bill is a practicing electronics engineer, and during his tenure as ALCOR Treasurer has also acquired a wife, a baby daughter, and a home. He is continuing to serve on the Board of Directors and the ALCOR Perfusion Team.

Sherry Cosgrove, the new ALCOR Treasurer, has recently completed a cost accounting for ALCOR. She is a newcomer to cryonics, but has rapidly and effectively enmeshed herself in ALCOR's financial affairs and perfusion team. The ALCOR Board of Directors has rewarded this show of exuberance by saddling her with the offices of Treasurer and member of the Board of Directors. Her husband, Jeff, is a Captain in the Marine Corps. Sherry is an Account Collection executive with Digital Equipment Corporation. She does that well too.

FROSTY THERMOMETER

Frosty has been absent from a couple of issues because there has been little in the way of contributions toward the vault project—until a few days ago, that is. We would like to thank Simon Carter, Thomas Donaldson and Kathy Woof for their much needed contributions. Simon sent us a week's salary, which was an incredibly generous thing for him to do, in light of the fact that he is trying to build savings in order to immigrate to the U.S.

We still have a fair way to go in order to reach our goal. At the moment the vault is sitting in the back of Cryovita, the "water logs" have been fabricated and filled, and all the ancillary details of how to insulate the necktube against heat generated from a fire have been worked out. Unfortunately, the patients are still sitting exposed and unprotected in a thin skinned stainless steel dewar right next to the very thing that could save them in the event of a fire or earthquake. Indeed, if we were to have an earthquake tomorrow the patient dewar might very well be compromised by the vault which it sits next to.

RESEARCH UPDATE

We have completed another Total Body Washout (TBW) successfully. This experiment did not go as smoothly as the others have in the post-operative phase. However, the animal survived and is doing well (see "Bringing Dixie Back"

elsewhere in this issue). This marks the third successful 4-hour, bloodless perfusion at 4 degrees centigrade we have completed. As of now we have two more 4-hour perfusions scheduled before wrapping up this project.

ANCIENT BRAINS—WHO ORDERED THIS!

Toward the end of December an article appeared in the LOS ANGELES TIMES which at first glance seemed like something out of science fiction—low grade, B-movie science fiction: supposedly researchers at Florida State University in Tallahassee had discovered the skulls of two humans who had lived over 7,000 years ago. No earthshaking finding there. But the article went on to report that inside those skulls were intact, complete brains and further that the researchers had recovered immense amounts of human DNA from those brains and succeeded in reproducing it via hybridization techniques!



What makes this finding so incredible is that the brains were found in Florida at a soil temperature of around 62 degrees Fahrenheit in a swamp! News reports were naturally sketchy on how this could have occurred, so we contacted the project leader, Dr. Glen Doran of the Anthropology Dept. of Florida State University for details. The story is a fascinating if somewhat incomplete one.

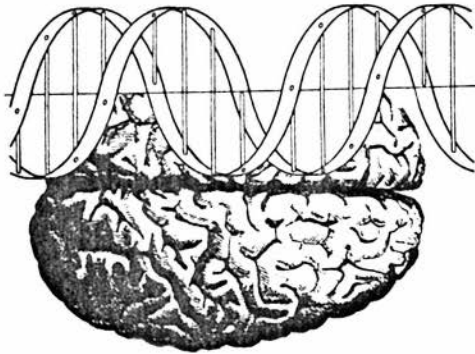
The brains were recovered from a swampy area in Titusville about 15 miles west of the space shuttle launch pad at the Kennedy Space Center. Dr. Doran said that the brains have apparently been continuously soaked in water for the last 7,000, years and that the water they were recovered from was extremely hard with a mineral content of approximately 3,000 parts per million (ppm). The selenium content of the water was also high at 5 to 6 ppm. The brains were unearthed at a subdivision development at 10 to 12 foot depth in a small pond used by these paleolithic people as a burial site.

So far the brains have been examined by CAT scanner, sectioned and subjected to light and electron microscopic analysis. Results of these studies are not yet in. One preliminary report indicated that there were some identifiable cells present, while another preliminary report indicated that this was not the case.

Several things are clear at this point: the gross architecture of each brain was well preserved, and the neurologist who examined them was very excited by the completeness of gross preservation. Sulci, convolutions, and gyri could be easily identified. Grossly, the brains appeared shrunken and had a consistency rather like that of liver pate'.

Most of the material now has been cooled to -70 degrees centigrade and more analyses are scheduled for the future. Dr. Doran expects publication of a scientific article documenting the find in more detail sometime in the next few months.

The recovery of brains from paleolithic America offers the prospect of



unique insights into the history of man on this continent. Evaluation of DNA fragments should offer clues about the origin and relationship of these people to existing racial groups and offers the more remote possibility of reconstituting genetically identical or similar counterparts to these individuals from the recovered DNA fragments. Preliminary estimates are that over 100,000 DNA fragments may be recoverable!

This finding brings to mind Huxley's quote about the universe being a queerer place than we can imagine.

Who would have dreamed that DNA, bearing the information about the structure of individuals buried 7,000 years ago in a swamp, would be made to function and replicate! How ironic it is that more remains of the identity of those two people, who coexisted with the dawn of human history, than exists of some people who walked the earth only yesterday and were cremated a scant few hours ago.

LAKE TAHOE FESTIVAL: START PLANNING NOW
by Mike Darwin

Start Today!

It's 1985 already and in a brief three months it will be time for the annual Lake Tahoe Life Extension Festival again! Three months isn't very long, and those of us with research or other papers to present are acutely aware of just how short a period of time remains between now...and then! While we're sweating, you shouldn't be. But you should be starting to get arrangements in order for accommodation and transportation should you decide to attend.



Getting Accommodations

A few words of advice are in order. Don't wait till the last minute to make motel reservations. The Festival is held on a holiday weekend so make them in advance and make sure the hotel or motel confirms that you will be guaranteed the rate you are given over the phone even though it's a holiday weekend. If you need inexpensive accommodations call Motel Six. There's one in Lake Tahoe, their rates are fixed nationally (at \$19.95 a night) and they will accept reservations three to four months in advance. But call early because these inexpensive rooms are always at a premium.

Motel 6
2375 Lake Tahoe Road
South Lake Tahoe, CA 95731
Tel: (916) 541-6272

If you need help finding a reasonably priced motel, call or write Fred and Linda Chamberlain at the address/phone number given below. These folks are the hosts of the Festival and they know the Tahoe basin inside and out. They can help you find reasonably priced accommodations and even steer you toward vacation outings to fill up nonfestival time. By the way, Fred and Linda are friendly, approachable people who are happy to spend time helping you get things in order to make the trip.

Why Go?

I've saved the most important piece of advice for last: why you should go. Every year I write a piece on why people should attend the Festival. Each time I sit down to write such "advertising" I find it easier. The best reason, of course, is that you'll enjoy it. Lake Tahoe is a beautiful place. Storybook snow-capped mountains and a beautiful travel-folder blue lake are two of the main reasons you'll enjoy. Even if you're an athletic zero, like me, I think you'll find the scenery alone well worth the trip. Of course, there are casinos, big name entertainers, incredible casino restaurants (and I do mean incredible) at very modest (sometimes even ridiculously low) prices, river rafting, steam boats, and horseback riding.

Then there's the Festival itself (mustn't forget that, must we!). You'll have a chance to meet some of the people you've been reading about in CRYONICS and to learn more about what's going on—first hand. The seminars are informative, but just as important is the chance to socialize and talk about cryonics. Really let down your hair if you like. It's a chance to be with people who don't think you're crazy just because you want to live. In short a refreshing change from the world of crazies we live in every day.

So, get on the phone and give your travel agent, the airlines, you Aunt or whoever you need to call a call...and come to Lake Tahoe!

Fred and Linda Chamberlain
LAKE TAHOE LIFE EXTENSION FESTIVAL
P.O. Box 16589
South Lake Tahoe, CA 95706
Tel: (916) 577-4746 (Paradise Rentals)

BRINGING DIXIE BACK--A RESEARCH DIARY by Mike Darwin

Introduction

The following is presented for those who wonder what it's like to do research work at ALCOR. To a great extent I think it's like doing research work anywhere; it's a lot of hard work consisting most of boring waits interspersed with periods of tedious concentration. It is also challenging, exciting and rewarding. It takes stamina and patience.

Few of the Suspension Members out there who do not come to ALCOR meetings or research sessions have any idea what the people who participate in research go through. I think fewer still of the Suspension Members really understand the outstanding dedication and perseverance shown by Suspension TEAM Members (for whom the rewards in no way compensate for the effort put in).

DECEMBER 8, 1984.



It's 1:00 AM. and I'm lying in bed trying to get some sleep. Wondering, worrying. Another Total Body Washout (TBW) experiment starts a scant six hours from now. Despite the fact that we've had three successes my mind is full of restless doubts. Did I remember to do everything? Will everything go smoothly? Will there be any equipment failure at a crucial time. What will the morning and the following 48 hours hold? Will she live? I've grown to like her. She's gentle and obedient—full of life. I hope she lives. I've got to get some sleep. Once the experiment starts it will be at least 20 hours before I can hope to close my eyes—if everything goes well. If...

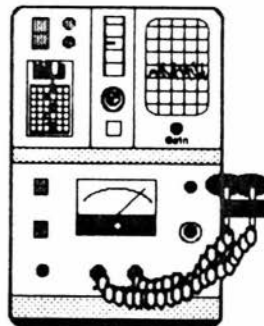
I get up, find my way into the bathroom without turning on the light. Turning on the light will wash away the fatigue I've begun to feel (which is my main chance for sleep). It's been a grueling three days just getting ready.

I open the medicine cabinet and find the Valium. Thank god they make them with a distinctive shape: perforated with a heart-shaped "v" in the middle. I don't have to turn on the light. Just feel for the hole in the middle and swallow it. A dangerous drug, very seductive. It quiets all the noise, turns the acid rock stereo off. Dangerous. Reserved only for nights like this when I absolutely have to get to sleep—and can't.

7:30 AM. The alarm. Get into scrub clothes. Grab a couple slices of bread and a jar of baby food. Get down to the ice house and pick up the ice for the experiment.

8:30 AM. Jerry Leaf and Hugh Hixon are the only ones at the lab. Jerry is slowly stringing out the perfusion circuit on the heart-lung machine. He's wearing a mask, so it's one of the few times he's not enveloped in a cloud of smoke. Cigarettes and coffee = Jerry Leaf. Hugh Hixon is doing a final calibration run on the blood gas machine. Last night he slept at the lab. I interrupt him to get a last minute pH on the perfusate.

Dixie, our experimental animal, gets her shot of Tagamet and some Thorazine. The latter to calm her down during the uncomfortable procedure of putting in an I.V. so we can anesthetize her. She is glad to see me and the cage rumbles with the steady thwack, thawck, thawck of her tail. She is very surprised at the injections. She looks very hurt and a little angry. I try to give her some extra attention. She seems mollified, quickly forgetting the discomfort.



10:30 AM. The rest of the team starts to straggle in at their appointed times. Al Lopp, reliable as usual, shows up with "provisions" for the day: lunch meat, fruit, bread, and soft drinks. I worry over the spartan fare. These people have shown up weekend after weekend. I wish we could afford something a bit more exciting than Honey Loaf and Kraft Lite Cheesefood Singles. They must be bored silly with the food. Better food would seem the least we could do. The checkbook says otherwise.

11:50 AM. Dixie is out cold. A little bit of trouble getting the I.V. in, but then swift darkness for her. Little does she realize what's about to happen, the incredible technical and yes, even human, drama which is about to swirl around her. She is simple. Her thoughts, if any, no doubt centered around her missed meal. No usual morning can of dog food—no water in her cage. Simple thoughts—then darkness.

There is a perceptible difference in the team. They know the routine. People flow from task to task. Things move smoothly. Dixie's heart beeps out into the room at a 126 beats a minute. Scott Greene and I start packing her in ice. Sherry Cosgrove faithfully takes notes. These sessions are quieter now, and more professional than when we first began them. Who knows, maybe I will get frozen by people who know what they're doing, should the need arise.

We have a team member who cancels. Hugh Hixon takes his place and scrubs in. Cancellations have been rare. This crew is professional. Carlos Mondragon begins to log Dixie's descent into deep hypothermia. The ice bags are doing their work. Jerry and Bill Jameson put the finishing touches on the heart-lung machine set up. The surgery begins. Dixie cools. The heart beeps slow to 90 times a minute.

2:13 PM. Dixie is on bypass. Jerry releases the clamps, Bill Jameson turns on the pump. Blood begins to flow through the heat exchanger, her blood pressure picks up as the roller pump takes over. A sigh of relief. The surgery is over, and she's on the blood pump. No complications so far, no danger of her continuing to cool while surgical difficulties stall connecting her to the pump. Her temperature begins to drop rapidly.

3:30 PM. She took longer to cool than the others. Her rectal temperature is 12.4 degrees centigrade, her esophageal 8.0. It's time to wash her out. The large bottle of honey colored liquid is brought into position. Corn starch, sugar, water and a few salts. The hundreds of dollars worth of ingredients sound so simple. They are to take the place of Dixie's blood for the next four hours. These "simple" ingredients are very unlike the blood they will replace. There is something of a thrill in realizing that no mammal has ever tolerated such drastic changes in blood and tissue electrolyte composition and lived—before these experiments being carried out by ALCOR, that is. A tremendous sense of aesthetic satisfaction and power sweeps over me. Here we are washing the blood out of a warm blooded, nonhibernating animal and cooling her down to a few degrees above freezing. It is the fulfillment of a hundred science fiction fantasies of my youth. In a heavy German accent I comment to Jerry Leaf "Veell, Dr. Frankenstein, vashout appears to be proceedink smootly..."



**"She looks utterly dead.
Her lips, tongue and eyes
are ashen gray..."**

3:44 PM. Washout is complete. She looks utterly dead. Her lips, tongue and eyes are ashen gray - devoid of any trace of the pink hue we associate with life. The pupils are massively dilated, the eyes begin to "cave-in" from the hyperosmotic perfusate. Her limbs and flesh stiffen as the fats in the tissues begin to freeze. It is quite difficult to inflate her lungs with the ambu bag. She looks as though she's been lying dead in a refrigerator for a day or two. Water from the air begin to condense on her tongue as her temperature drops to 4.5 degrees centigrade. The respirator tubing fails to show the characteristic misting on exhalation. Indeed, her lungs are probably condensing water out of the air. Her temperature is just a few degrees above freezing. I begin my usual pessimistic diatribe "Now we've gone and done it, killed her. This dog is dead—no way she's ever coming back, not after perfusion with liver and pancreas remover." Anna Tyeb examines Dixie and heartily concurs: "Dead!"

4:18 PM. The recirculation period is endlessly boring. Take readings, sit and watch. Someone has to be with her at all times making sure a cannula doesn't come out, or the oxygenator doesn't get pumped dry. Most of the team heads up front to the "office" to get some "lunch", shoot the bull and just relax. The tension sometimes is so thick it's almost suffocating. These things cost a couple of thousand bucks and besides, we want her to live. She deserves to live.

Sherry Cosgrove and I are the only two left in the O.R. The more I see of Sherry the more impressed I AM. She sticks with it, she is hard working, takes the initiative and gets the job done. Immensely competent. I begin to feel anxiety. We are growing quite rapidly to depend on her. My own insecurities make me aching to rely on people who don't drain you dry of energy supervising them. Sherry is a real self starter, an asset. What will we do if we lose her? When will she move away? I keep telling myself I should be grateful, look on the bright side... But the grim reality is that poverty makes you dependant. ALCOR is small, vulnerable. There's no escaping the fact that ALCOR leads the kind of existence that many of us lead personally: we get by, barely, as long as the brakes don't go out on our cars, or the hot water heater doesn't die on us. We're surviving, but even a little setback is a real disaster.

I begin to get depressed. Frantic even. How in the hell is this supposed to work, save my life even, when I have to worry about things I can't control and sweat pennies for lunch expenses for the crew? It's hell being that dependant and that restricted. All I can do is hope, wish for luck, pray the brakes don't go out 'cause there ain't no money to fix 'em.

4:30 PM. I go up front and get a bite to eat. Several conversations are going on. I don't feel like getting involved in any of them. I carry my sandwich back to the O.R. and do a blood gas and pH. Her pH is way down to 6.99. I go up front and tell Jerry. I interrupt his smoke, he sets down the coffee and follows me back. We start a bicarb drip, push 50 cc more of bicarb into the oxygenator. The pH comes up. It isn't what we want, but it'll do.

7:55 PM. Her blood has been replaced, she's rewarming and I'm starting dialysis. This is the big moment for me when I have to perform and bring Dixie's electrolytes back to sane values, values she can, hopefully, live with. Blood courses through the artificial kidney, filling the thousands of hair-like fibers. I anxiously look for leaks. These kidneys are old. This one had "DROPPED: DISCARD" written boldly across it. Nothing to inspire confidence. There are no leaks. Those Germans make a good kidney. I crank the flow on the kidney machine blood pump up. The pace of her rewarming accelerates. Blood gas readings come in a steady stream now. Dialysate and blood pH are checked and rechecked, balanced and rebalanced. Soon now we'll know if we have saved her heart and lungs.

8:20 PM. Her heart begins to stir. Beat follows beat. A regular rhythm. Her heart has made it. At 8:30 PM. she comes off dialysis. Clear saline solution chases red blood back into the heart-lung machine tubing. There are smiles and some surprise—her heart has started beating at 17.2 degrees centigrade!

8:46 PM. Her tongue is once again pink. She doesn't look "stiff and dead" any longer. A small thrill of excitement and satisfaction passes through me. She is beginning to make the long journey back to the land of the living. Her temperature is up to 24.4 degrees. Her paws are twitching with involuntary movement. There is slight twitching movement of her head. This sign is encouraging. But we are not overwhelmed with anticipation. If the past is any indicator these hopeful signs will disappear and there will be many hours ahead of long, lifeless quiet, without so much as a muscle moved to reassure us that she is still "inside there," as Anna says.

9:55 PM. She is not rewarming on her own very well. No shivering. Jerry puts her back on the heart-lung machine for more vigorous rewarming. She is quiet and still—pupils constricted to pinpoints, eyes turned back in her head. This is the worst time, the very worst time. Waiting, hour after hour for the brain to regain its balance, and the magic of consciousness to return—if it will return. I liken the procedure to a minefield. So many things can go wrong. She could bleed, she could simply not wake up. She could get infected if she does wake up. Or die of liver or pancreatic failure. It's a minefield.

10:35 PM. Her temperature is 34.3. Jerry takes her off the pump. More waiting. People are showing their fatigue. Most are huddled up front in the office working over the last of the food. Sherry Cosgrove stands guard in the O.R. I wander in and out. I'm very tired, but the kidney machine needs to be cleaned and bleached. I pull it out into the cold night air. Orion is shining high above. Even though it's California, my breath forms big misty clouds. Scott Greene comes out and lends a hand. This makes the work go a little faster. I wish I had more energy, I'd try to teach Scott how to do the whole wash procedure. Instead, I kind of bark things out occasionally—not very effective. It's probably just as well. He's tired too.

10:50 PM. She's breathing on her own! None of the others have started

spontaneous respiration so quickly. Maybe I won't be up all night after all. Wishful thinking.

11:50 PM. Corneal reflex: her eye blinks when you touch it. Barely. Progress. The brain has probably made it too!

12:30 PM. Jerry completes closing the wounds. The ranks have thinned out. Those with families (save for Jerry and Sherry) have split. It's nearly 1:00 AM. Pizza Hut closes at 1:00. It's a "free day" today, the one day a week I allow myself a liberal fat meal, i.e, cheese! Pizza's have become the treat I use to get myself through this aching time of worried anticipation. I call in the order and run over to pick it up. The girl in the restaurant who takes my money looks at my scrub clothes uneasily, fixing her eyes on the mask dangling around my neck. They've heard what goes on over at Cryovita. Body freezing!

It isn't a New York pizza, but it's great. Scott and I share a medium. I eat about 3/4ths of it. He's probably feeling worse about his two slices than I am about my six or eight, and this makes me feel better. Misery loves company.

5:05 AM. Dixie is awake. Lifting her head up, fighting the endotracheal tube. Very restless. At 5:20 she has her way and we pull her stomach tube and tracheal tube. Time for me to get some sleep. I'll need it. I'll be relieving Jerry in the afternoon. He can go well over 24 hours with no sleep and not sweat it. Coffee and cigarettes--the secret of supermen everywhere. Maybe I should think about it...

12:30 PM. The alarm goes off. Where AM I? Totally disoriented. Where are the doors and windows. What a strange thought to have. Well, up and at em! A shower. Skip shaving. Where I'm going no one will care. The shower feels incredibly good. Like washing a week's worth of dirt off. Fresh clothes. Go forth and conquer!

1:00 PM. She's still very weak, but I'm impressed by her progress. She's drinking Ensure (liquid nutrition) from a bowl instead of needing to be fed from a squeeze bottle like Enkidu and Bear, our other four-hour survivors. Still,



A moment of quiet during what was to be a stormy recovery.

she's a handful. She exhibits a peculiar "windmilling" motion with her forelegs. Suddenly, she tenses, the left side of her body goes rigid. Within a second she has a full-fledged grand mal seizure. She recovers quickly, but the windmilling, which I'm told has been going on all morning, continues. She responds to her name. She drinks a couple of cans of Ensure liquid food. This is the first time we've seen anything like seizures in any of our animals.

2:50 PM. Another grand mal. This is looking bad. There is clearly some right brain

injury. Her left face is slack, though her left limbs look okay with normal movement and response to pain. We start her on Valium to control the seizures.

5:38 PM. Another grand mal, several petit seizures as well. More Valium, and we load her onto a gurney for a visit to the emergency pet clinic a few blocks away. The vet gives us a prescription for primadone—a more potent medication to control the seizures. Scott relieves Hugh and me for a dinner break. He has finals the following day. He spreads out his books and papers and begins to study. I don't envy him. Hugh and I head off into town to the Spaghetti Factory. What a relief just to be away for a few hours. Everything is so elegant at the restaurant and all the personnel are so clean cut and attractive. I mentally consider what the personnel ads must read like: "Young and irresistably attractive? Sought after to do covers for Gentlemen's Quarterly and Teen? Looking for an exciting job in a spaghetti restaurant..." I decide that the premium on good looks must be lower than I thought. After a relaxing wait we are shown to our table by a sincerely smiling young woman who leaves a warm glow and two glasses of cold water in her wake.

Returning from dinner we find Dixie is a real handful—managing her I.V.'s, keeping her fed, cleaning her up when she urinates or defecates. Every five minutes there's a major task at hand.

11:26 PM. The primadone isn't working. Seizures, seizures and more seziures. Valium, Valium, and Valium. They're wearing both her and us down. I decide to start her on pentobarbital—the only barbituarate we have.

12:00 PM. Resting quietly. Control at last—we hope.

3:00 AM. The night is passing in a haze. I fall asleep only to be reawakened a minute later. I am overwhelmed by anxiety that she might pull her I.V. out. We are all exhausted. Scott has gone home. He has class in the morning at around 8:00 AM, with finals. It's going to be a rotten day for him too.

8:30 AM. She ate some lunch meat. Seizures look well controlled.

11:30 AM. Hugh spells me, and I run home for lunch. He heads out to Wendy's when I return.

7:17 PM. Dixie's abdomen is distended. Her bowel sounds are diminished. What's going on?

12:00 midnight. She wakes me up crying. Belly very distended.

December 11, 1984

1:20 AM. She vomited about 150 cc of partially digested food. It gives her a little relief. I get the sinking feeling we're going to lose her after all.

1:36 AM. She's restless and crying again. I decide to pass a stomach tube and suction her. Hugh is sound asleep, exhausted. I decide not to wake him. I'll try it alone. She fights me powerfully, but the job gets done. She seems almost grateful for the distraction. I get about 400 cc of stomach contents. Back to sleep.

4:00 AM. She's restless again. Time for pain and seizure medication. Back to

sleep for both of us this time.

5:00 PM. Eating well. Stomach doesn't look good, bowel sounds diminished. Is she obstructed? Necrotic bowel? Or just delayed emptying?

6:30 PM. I drive down the 57 Freeway to Veterinary Labs to get her lab work. It's raining and the weather is hideous. The lab tech who handles our work looks over the results with me in the lobby. I settle down in my truck under the dome light trying to make sense out of the numbers. Just like the others, we've injured about every organ system we can evaluate. Liver, pancreatic, and other tissue enzymes are sky-high. Nothing unusual, though. In fact it looks good, as things go.

Another night like the one before. Very restless. Very little sleep for either of us. If we back off on barbiturate medication she seizes. Progress at this point is well behind that of Bear and Enkidu.

December 12, 1984.

12:40 AM. Hugh and I suction 1,800 cc from her stomach. Looks like an obstructed bowel or maybe a side effect of barbiturates. In any event we need to get a central venous line in and start her on hyperalimentation: complete I.V. nutrition.

2:10 AM. Grand mal. Valium required to break it.

6:30 AM. Jerry shows up to do the cut-down. Jerry looks like hell, almost as bad as Hugh and me, and we've been up for an hour or so getting things ready. I feel very concerned for Jerry. He has had to delay going into work in order to come out to the lab. Despite the fact that's he's obviously had very little sleep he'll have to follow his morning at Cryovita by a day at work.



Dixie rests her head on ALCOR mascot and permanent lab resident "Slinky."

The goddamn sterilizer won't work! It keeps losing pressure through the relief valve. Hugh tears it down and finesses it into working. When I bought the thing they warned me not use it for anything but parts. I now see why.

11:30 AM. She's semiconscious from the anesthetic we gave to put the jugular line in. The line is in place and we've got hyper-al running. She's stable enough to transport to the vet for an upper GI (Gastro-Intestinal) X-ray series. It's going to be a long, long day.

12:30 PM. The first film shows delayed gastric emptying. She's still very lethargic and responds only to vigorous

stimuli. Even though it's supposed to be ultra-short acting, the anesthetic really zapped her. No doubt her liver isn't up to snuff. With an SGOT of 1198 (80 is normal) I can see why her liver isn't doing cartwheels in getting rid of the anesthetic.

6:00 PM. Films show very slow filling of the gut. We'll have to bring her in at 6:00 AM tomorrow and get a final film. Back home she goes.

6:30 PM. She hasn't urinated in 12 hours. Her bladder is distended. She proves difficult to catheterize. I feel very sorry for her. Sorry that she has to suffer the discomfort. As I stroke her head I notice the beginning age spots and middle aged appearance of the skin on my hands. My resolve strengthens. I want to live pretty badly. With luck and hard work maybe both of us will make it through this.

7:00 PM. I head out to our favorite haunt for Chinese food. When I return we set up a card table in the O.R. where we've camped out, and have dinner. Outside the wind is howling and the rain is pounding on the plastic skylight. It's "bitterly" cold by California standards. We have a space heater running in the O.R. The O.R. feels very warm and safe inside.

2:00 AM. Jerry comes out with a text on dog anatomy. We succeed in getting her catheterized after several unsuccessful attempts. We get 1900 cc of urine via the pilot catheter and then we pass a guidewire and put in a more permanent foley catheter. The barbiturate is interfering with both her bowel and bladder function. We are exhausted. Hugh and I crash. The sleeping bag I crawl into on the egg-crate foam never looked so good.

3:30 AM. Now I have two catheters to worry about her pulling out—I.V. and bladder. She is up, down, and around on her forelegs all night long.

6:00 AM. The vet is late, he overslept. Wish we'd known! God do we need some sleep. It's been a couple days since we've showered and I've got a two day growth of beard. I look very, very disheveled. I wonder what the office girls think. Drug addicts?

7:00 AM. Film looks good. There's barium all the way to her butt! No obstruction. She'll probably live. But will we...?

POSTSCRIPT

Dixie did live. But she gave us a good deal more excitement before she was done with us. She developed a seroma, a tumor-like, fluid filled sac at the site of one of her wounds, and this necessitated more surgery. She also developed bone marrow suppression from one of the antibiotics she was on.



January 7, 1985. A gentle face in search of a home.

Gradually her seizures resolved and she was taken off medication.

As of January 3rd she is doing well: eating, running, and getting into mischief, although, she isn't back to normal yet. Her balance is still not good and her coordination is spotty. We think it very likely she sustained some damage to the motor area of her right brain. Only time will tell if these things will resolve. In the meantime, she remains with us, well cared for and given plenty of attention, fresh air, and love.



A JOURNEY INTO THE LAND OF THE
MORTALS

by Thomas Donaldson

I've recently visited my relatives in the US, in itself hardly a surprising thing to do. But none of my relatives are cryonicists, and for the first time in a year, I spent many days associating closely with non-cryonicists. It felt like I was visiting Martians; those people out there have heads filled with

very strange ideas. Just how strange, I can only attempt to show by telling stories; it's not that I have any problem with my relatives, but instead, that prolonged association this time gave me a powerful impression of just how far we have to go before we have any chance of even getting UNDERSTANDING from these people. Acceptance and conversion would take far more effort than mere understanding.

My visit took place in Christmas of 1984. William Schroeder, recent heart transplant patient, was much in the news. We've generally seen pictures of him on TV, in his hospital bed. He does not look like a healthy man. All the time I was visiting, the television news rang with hopeful news about the progress of William Schroeder. The family were all very interested in his fate. It was a good thing that William Schroeder was going to take a shower ("life's little pleasures").

I've written about artificial hearts before. Look, folks, I'd like to be wrong, but I don't expect William Schroeder to be alive in 6 months time. To me, all of these efforts look like a desperate attempt to evade cryonic suspension while at the same time not actually dying: an effort which does not seem likely to succeed. News commentary, of course, is full of bright and optimistic sayings. Soon he will be out walking, soon he will be able to go home. Oh dear, he's had a slight stroke. Doctors in Louisville have taken him off the critical list, saying that he is only "serious" rather than critical. All of the optimism is really a deter-



mined attempt to delude oneself about the real meaning of what's going on. Even if his artificial heart were to work perfectly, William Schroeder is on his last legs. We see all these pictures of a gray and unhappy man, with voiceover commentary about the wonderful progress he is making.

So, with a background of optimistic commentary about a dying man, I visited my relatives and conversed with them.

Sally, one of my sisters, has two children. She is as yet the only member of the family to have produced progeny. We've spoken about cryonics for several hours; she knows about my involvement quite well. She knows what the purpose of cryonics is, and how strongly I feel about it. She knows that Kathy, my girlfriend of many years, is also a Suspension Member. I was surprised when she turned to me asking: "Thomas, what are you and Kathy doing about the perpetuation of the race?"

Uh. Well. Principally, I said, we are arranging our cryonic suspension. She gave me a blank look. Cryonic suspension? Is that preserving the race? Well, sort of. I pointed out that if Kathy and I remained alive, then the human race would survive with us. I didn't say, because I thought it would confuse her even more, that if we couldn't survive ourselves, then I didn't feel that the survival of the race would have much meaning. That I had no special feeling that the "human race" wanted or deserved any special sacrifice from me to ensure its survival independently of my own.

Just then, I had the intense feeling that Sally hadn't really assimilated ANY of the hours of discussion that we'd had about cryonics. She'd just filed it away somewhere to gather dust, hopefully never to call it up again.

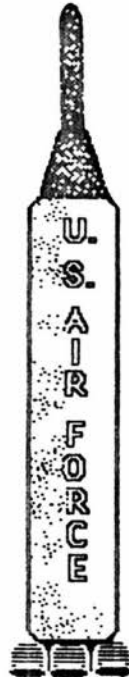
Christmas dinner came around (with background of news: William Schroeder eats Christmas dinner with his family, in the hospital, with William Schroeder looking unwell but smiling wanly). Of the fit subjects for conversation after Christmas dinner, my family decided that nuclear holocaust would be a dandy subject for discussion.

Like most families (I'm sure that most everyone reading this will have had the same experience), different branches of the family have come to have divergent political opinions. Family get-togethers of course become prime occasions for airing these differences. I guess the family is a great institution just like Reagan says. Where else can one get to meet people who openly, shamelessly admit to voting for Mondale?

Perhaps other families all sing carols and do the sorts of things that television families do. My family had a political argument about arms policy.

Like most political arguments, it never seemed to get anywhere (of course not, since nobody was going to admit to having changed their views, not never, not nohow). But "survival" seemed a theme of intense interest, and the problem of how "WE" were going to survive constantly appeared in the conversation. This went on for a long time. Finally, I had to put my my two cents in.

After all, I said, given 70 years nobody except the two children



(and possibly myself) would be alive anymore. Why are you talking so much about survival when you will not survive? I opined as to how all the public interest in nuclear holocausts was basically an attempt to avoid a much more fundamental personal issue.

Obviously, by bringing up this point I was BREAKING ALL THE RULES. They didn't want to hear some nut go on about his own private bee in his own private bonnet. They wanted to talk about a central issue of fundamental public concern, a really important political question of our times. Who the hell does this guy think he is, to bring up this completely tangential and private point in the middle of the discussion?

Naturally, it didn't go over very well at all. But then, they knew I had a deep involvement with cryonics. For some reason, though, conversation on the topic of nuclear holocausts kind of died down after that, and we moved on to other things.



Still later, my mother and I went to lunch together. William Schroeder, I think, was having a shower at the time. My mother was really proud. She had written her Will. She obviously felt cleansed and RESPONSIBLE. She'd done all the right things. Her house was to go jointly to all of her four children, to be sold or kept as they decided by majority vote. Her other property was to be divided equally among us all. She had got everything arranged. She had been a Good Girl. She had been a Responsible Citizen. She was ready to go now.

"Mother, why haven't you made any arrangements for cryonic suspension? You know that you can afford it."

I guess her behavior had not elicited quite the reaction that she expected. Uh. Well. She didn't want to think about THAT. Not at all. Not ever.

Oh.

And so conversation turned to the topic of Health, in which she had considerable interest, being 65 years old and noticing that she wasn't working quite so well as she used to. Did I have any recommendations for anything that she could do? That is, without actually arranging for THAT.

If you don't want suspension at age 65, there isn't really a whole lot you can do. I suggested GH-3 and Hydergine, and told her about the recent experiments reported in GERONTOLOGY in which Hydergine had improved the health of aged subjects.

Of course, to ask for a solution to the problem of death and refuse to consider suspension just isn't going to work. How can one give advice to someone who won't accept it unless it fits with what they want to do anyway? Hardly a rare problem.

It is true that cryonics gets a lot of publicity. We can have reporters falling all over themselves to interview us anytime we want. Cryonics isn't

even seen as a fringe subject; I've never personally met anyone who feels that cryonicists are nuts in the same way as people who believe in flying saucers are nuts. But cryonics is a different kind of thing. It's as if we had this private, well, TASTE in funerals.

"Of course, I don't feel that way myself, mind you, but if somebody wants to get themselves frozen at death, then they have a right to it, just like someone who wants their ashes scattered at sea. It takes all kinds to make a world. A bit unusual, but nothing to move anybody. Each to his own."

The point is, that without all of our thinking on the subject of repair, on the subject of immortality, an entire world view, most people see us only as having unusual and aberrant ideas about the disposal of our remains. An odd taste in funerals, which certainly bears on nothing to do with our LIVES.

It's clear that we have a great deal of education to do before we can move many people to arrange for their suspensions. I personally feel that magazines like CRYONICS have a very important role that way. It takes a much deeper understanding of cryonics than the media could ever convey for someone to arrange for their own suspension. Most of the ideas behind it simply don't get explained at all (STATED, sometimes, but EXPLAINED, never). A simple statement of ideas doesn't evoke any particular belief, and in fact, none of our ideas are at all obvious. Along with cryonics goes a rearrangement of priorities for many normal things that people take for granted.

That last, of course, is really important. Most people have their life planned out for them from the moment they are born. They are good boys and girls if they follow the script. If they don't, they are BAD. (Someone I knew in college was really torn up inside when I met him again at the age of 25. Why? Well, he wasn't MARRIED yet!) People are supposed to get married at about twenty-five. They are supposed to have children right after. Eventually the script tells you to die, and you then obediently die. That's what being a Good Boy involves. Thinking about death is something you do at age 75, not before. Are you morbid, or something? Cryonics just isn't in the script. Even THINKING about cryonics isn't in the script.

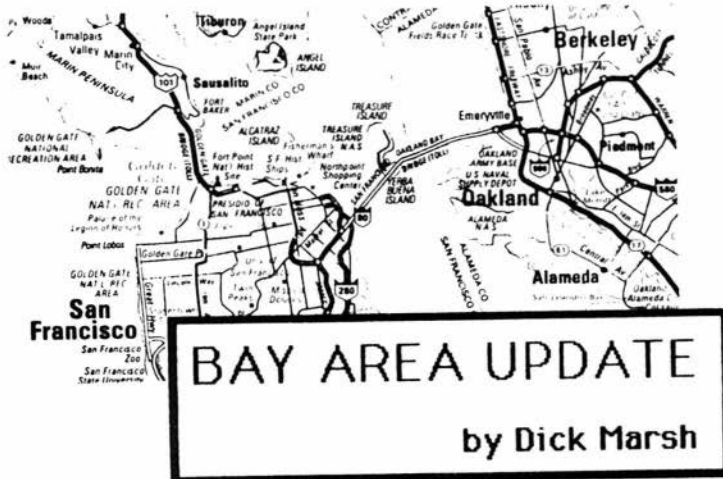
"I hate victims who respect their executioners"

--Jean-Paul Sarte

**"I too had thoughts once of being an intellectual,
 but I found it too difficult."**

--Albert Schweitzer

**(Addressing an African who refused to perform
 some humdrum duty on the grounds that he was
 an intellectual.)**



The Cryobiology Conference: Good Vibes for BACS and TT.

The slang may be dated, but the feelings were real as Dr. Paul Segall told the BACS Board at their September 9 meeting about the relatively warm reception given his presentation at the August 21-24 Cryo-84 Conference in San Diego of the BACS-sponsored hamster-suspension research. Everybody felt good as Paul told about the apparently changing attitude towards cryonics of the Cryobiological Society, sponsors of the Conference.

Paul reported that discussions with a number of Cryobiological Society leaders indicated that they no longer felt that cryonics advocates were "'not real scientists,' but rather that the gulf that separates the Cryobiological Society leaders from cryonics advocates was purely emotional." However, Paul added, "the Cryobiological leadership felt that it would take time for cryonicists to be accepted by them."

Well, we can wait--if we must.

Present with Paul at the meeting were Dr. Harold Waitz and BACS member Saul Kent. Also attending: Mike Darwin, Jerry Leaf, Dr. Greg Fahy, and Hugh Hixon, all from ALCOR.

Paul commented that the BACS paper "was received without criticism." Further, he added mysteriously, "it was even rumored that at least one well known cryonicist might be invited to present material at next year's Cryobiological Conference to be held in Madison, Wisconsin."

Quaife says, "Too Much!"

Trans Time President Art Quaife has had it with overwork, underpay, criticism, "threats," and excessive administrative work. He wants more space in which to continue his personal and intellectual growth, and he may take a part-time temporary job as a logic consultant in the computer industry. So he announced at the November 25 meeting of the Trans Time Board that he plans to reduce his work-week from its present 70 hours to a more reasonable 31.

Knowing Art's commitment to cryonics, I'll believe this when I see it happen. But it should happen. Art is a brilliant guy, grossly underpaid and overworked, who has long subordinated his individual needs to the greater good of the cryonics movement. I feel personally indebted to him and would like to see him live the better life he is entitled to.

But I hope he continues to serve the cryonics community. Anything else would be tragic for us all.

Lose One, Gain One.

John Krug, one of the more active members of the BACS Board, has resigned, citing as a reason his loss of faith in all cryonics organizations. The Board unanimously voted him a certificate of appreciation for his long service.

John was replaced on the Board by Dr. Hal Sternberg, biochemist with the Pacific Medical Center.

Messianic Outreach?

Like you, I want to help cryonics and the life-extension movement. I lack the training to do biomedical research, but I have had a long career as a teacher and a broadcaster. Therefore, when I retired recently, I startled the world with the explosive statement that I now consider myself a "life-extension propagandist." Seemed the best way I could use my professional experience to advance the most important phenomenon of our time: the battle against aging and death.

I believe that we need to raise people's consciousness about the desirability and the growing possibility of age-control and death-control, using the media or any other means open to us. Lots of people still want to die and look upon aging and death as desirable and inevitable. This tends to be a drag on the research that might help the life-lovers among us. So I suggested at the September 16 meeting of the BACS Board that we look into the possibility of being less ingrown and seek ways of getting the word out.

In the BACS minutes, Paul Segall wrote (in part): "Dick Marsh. . . cited the kind of awareness enhancement engendered by the ALCOR Life Extension Conference of 1977. Essentially, he was asking if the life extension philosophy could be expressed in a more inspiring, messianic way which would have a greater global appeal."

I don't mind being associated with the word 'messianic,' but I am disappointed that nothing came of my suggestion. Probably John Day was right when he suggested that outreach meetings are not well attended by outsiders, and I suppose it's OK that my messianic enthusiasm ultimately led only to a discussion of a proposed cryonics picnic.

But I still think that we cryonicists have a big public information job to do. Life-extension propaganda precedes and makes possible life-extension research.

Life-Extension Propaganda?

The word propaganda comes from Congregatio de Propaganda Fide or Congregation for Propagating the Faith, an organization established by Pope Gregory XV in 1623 for missionary purposes. Propaganda was thus originally considered to be a very fine and noble thing and simply referred to the propagation of religious ideas. It can still be used in a very positive sense to mean the propagating or spreading of humanly valuable ideas. That's how I use the word.

In the San Francisco Bay Area school of cryonics, we still believe in the

usefulness of propagating our ideas about life extension, however much we may disagree about the means of doing so. We call the process "publicity," and we stretch the word to cover many things. For example:

** U.C. Berkeley's Office of Public Information released a story in October about work performed by Paul Segall in the Department of Physiology-Anatomy. It describes a new hypothesis on aging presented to AGE--the American Aging Association--that aging results from the loss of specific cell groups in the brain and endocrine system on a genetically programmed schedule.

It also mentions Segall's earlier experiments in altering the rate of aging in rats by restricting their diets. These experiments led to the new aging hypothesis.

The news release also referred to Segall's current experiments in the recovery of hamsters from low-temperature preservation. The article concluded that Segall "hopes that these studies will lead to a better understanding of the stresses of low temperature on the body and its applications in the medical world."

As a result of the news release, articles have appeared around the country describing the research. It also prompted the San Francisco office of television's Cable News Network to request and receive several video tapes showing the revival of hamsters following asanguinous hypothermic perfusion.

The article in its entirety is printed in the September-October issue of BACS NOTEBOOK.

** Hal Morgan and Kerry Tucker's new book Rumor (Penguin, 1984) has a section containing denials that Walt Disney was frozen and reporting that Trans Time, unlike some other cryonics service organizations, has been able to maintain people in suspension and is a "viable business."

** The September 5th issue of the U.C. campus newspaper The Daily Californian ran an article describing Berkeley-based cryonics activities, discussing Trans Time in detail, and mentioning the BACS hamster-suspension project, portions of which are being researched at U.C.'s Department of Physiology-Anatomy.

** Several BACS members were called by High Technology newsletter for information concerning cryonics to be distributed to potential financial investors.

** On November 29 Paul Segall and I along with Chadd and Royce Everone and Dr. Robert J. Parker appeared on Bay Area cable channels 16 and 32 in a remarkably well produced live television program on life extension originating in the studios of Peralta College's PCTV. Paul was brilliant and informative as usual in explaining cryonics. I stumbled along as well as I could. I was, however, pleased at the audience reaction (laughter and applause) when I told them about my plans to have bumper strips and T-shirts printed with the slogan DUMP DEATH--RESEARCH LIFE EXTENSION. (There was no hissing.)

Thus the word gets "propagated" on a subject that surely never entered the head of Pope Gregory (and may be unpalatable to Pope John Paul).

Trans Time in the Black.

September's net income for Trans Time was a positive \$250.63. Reason:

\$1000 in photo rights from Germany's Stern magazine and a \$1476 contribution from the Violet Jones Suspension Escrow account. What's more, President Art Quaife revised his earlier cash flow projection through the end of the year to include an increased revenue of \$4200, largely from video tape sales.

But we can always use more cash. Hence a suggestion by Jerry White that Trans Time sell its superfluous lab equipment led to the formation of a sales team consisting of Harry Waitz, Paul Segall, and Richard Potvin.

BACS Membership Grows.

The above-named Richard Potvin is a new BACS full member along with Raphael Haftka and Dr. Hal Sternberg, who is also a new BACS Board member as earlier noted. Trans Time's Emergency Responsibility list has consequently grown.

The noted physicist Saul-Paul Sirag has upgraded his membership, using the new plan that allows a \$300 a year payment for four years instead of a flat payment of \$1000.

Don't know whether it's true or not, but there's a story told in the Bay Area (you've probably heard it) that Sirag, Saul Kent, and Paul Segall like to show up places together so that they can introduce themselves by saying:

"I'm Saul."

"I'm Paul."

"I'm Saul-Paul."

BACS Board: Responsibilities of Members?

At his last BACS Board meeting before resigning, John Krug raised some sticky questions. Prompted by Attorney Jim Bianchi's May 23 legal memo, John expressed anxiety about who has the responsibility of filing tax returns, maintaining a book of corporate resolutions, and verifying suspension financing.

He moved that the Suspension Procedures Verification Committee (currently Jerry White, Jim Yount, Art Quaife, and Norm Lewis) and the Suspension Funds Advisory Committee (currently Jack Zinn, Jim Yount, Bob Mish, and Dick Marsh) be submitted to the membership for approval as permanent standing committees required by BACS By-Laws.

During the discussion "Paul Segall reiterated the need for proper disclaimers in [those] matters [in which] the projected tasks exceeded the current capabilities of cryonics service organizations."

John's motion, after respectful discussion, was deferred to the next meeting in order to allow time for study.

Food Supplement Marketing?

At the same meeting, Jack Zinn surveyed the Board members to determine their food-supplement-consumption habits. Will we--or will he--soon be selling life-extension-related products?

BACS Dues Increase--Maybe.

President Zinn asked the Board to consider a 10% dues increase. This in

response to President Quaipe's announcement that Trans Time must raise its Emergency Responsibility fees from \$96 to \$108 annually and its long term whole body storage fees from \$3200 to \$3600 annually. To justify the fee increases, Art cited rent increases imposed on Trans Time and the fact that current expenses exceed current revenues.

This was at the September 16 meeting. The following month--on November 25--when Jack moved a dues increase, Paul Segall made the point that the situation in life extension generally and cryonics specifically is so volatile (albeit promising) at the moment that now is not the time for a dues increase.

So Jack's motion died for lack of a second.

ALCOR to Get BACS Emergency Responsibility List.

ALCOR--via a letter from Mike Darwin--has asked for a copy of the current BACS Emergency Responsibility List. The BACS Board unanimously agreed to supply it, expressing the hope that the action would lead to closer cooperation between the two groups.

Vivisection.

At the November 25 meeting I went messianic again and raised the subject of kindness to animals. (I hope you will forgive the first personal pronoun, but it seems to me that third person references to myself as "your UPDATE editor"--see previous issues--are awkward, stilted, scholastic, and forbidding, and I say to hell with them.)

I stressed that I totally support animal experimentation as a necessary part of life-extension research but that I am very uncomfortable with the thought that animals used in BACS-sponsored research may be suffering unnecessary pain.

Paul Segall, who, along with Harold Waitz, does most of the research, assured me that every attempt is made to minimize animal suffering. In the ensuing discussion, these were among the points made:

** People tend to be selective in their concern. They are distressed when a cute little animal like a hamster or a lovable animal like a dog is made uncomfortable, but they don't leap to the defense of "nasty" little animals like rats.

** Attempts to defend the rights of rats and other rodents would swell their population and greatly increase the risk of bubonic plague, which could be fatal to humans in large numbers. It's them or us (if you'll forgive the grammar). The world is a cruel place, and we life-extenders must take it as we find it.

** People are inconsistent. Many animal rights activists are meat-eaters and wear clothing made of leather and fur. There is more cruelty by far in slaughter houses than in research labs. Even we tender-hearted (and diet-conscious) vegetarians and semi-vegetarians are not beyond criticism. When land is plowed for the planting of vegetables, numerous mice and other little animals are plowed under or deprived of their nests.

The upshot of the discussion: When animal needs and human needs conflict, as they sometimes do, the animal may have to be subordinated to the human.

Okay. I have to admit it. But I don't have to like it.

Famous Professional Old Folks.

Paul Segall closed the September meeting of the BACS Board by describing "a so far unsuccessful attempt to communicate with the ailing artist Salvador Dali, who once told Saul Kent that he wished to be frozen at death. Jerry White suggested that we contact actor George Burns, known for his vigorous resolve to oppose the usual infirmities of aging."

It's hard not to love and admire George Burns. But what kind of role model for the aging is he with that stupid cigar?

New Quarters--Maybe.

The search for a new Trans Time facility continues. John Day and Jim Yount have found a two-bedroom house with an adjacent storage shed. They believe that this property, located in a manufacturing area in San Jose, could be obtained for under \$100,000.

In addition, considerable excitement was generated when a group of interested people from BACS and Trans Time visited a very attractive, spanking new industrial condominium in Berkeley. The units we examined were high-ceilinged, equipped with plumbing, and provided with large street-access doors. BACS Vice-President Ron Viner, however, felt that they were over-priced at \$110,000, and he was disturbed by the fact that the structure of the building prevented future add-on growth.

Biophysical Research and Development (BPRD) Still Active and Productive.

A November 9th Progress Report from BPRD, BACS' research subcontractor, addressed to the Foundation for the Enhancement and Extension of Life (FEEL), one of its chief funding sources, describes its many activities. A few highlights (directly quoted and/or paraphrased) of this very detailed report follow:

** Drs. Harold Waitz, Hal Sternberg, and Paul Segall, working in conjunction with University of California senior Sandra Gan, have developed a blood substitute with an ionic composition reflecting the intra-cellular environment which permits revival of hamsters from asanguinously perfused states below 1°C. This new blood substitute is used in conjunction with the previously employed solutions, which were more similar in composition to blood.

** A new procedure for the perfusion of hypothermic hamsters has been developed in which the chilled hamsters are initially perfused with the Ringer's lactate based (extra-cellular type) blood substitute used in past experiments, and then subjected to perfusion with the intra-cellular perfusate (ICP).

** After a substantial number of failures, BPRD researchers have been able to briefly revive 2 hamsters subsequent to perfusion with ICP. One had also been perfused with extra-cellular type solution. Circumstances led to its being allowed to warm to the point where its rectal temperatures reached 12°C, with its head undoubtedly becoming even warmer.

It was again cooled down with ice, its vasculature was flushed with a special extra-cellular type of perfusate, and the animal was perfused and transfused with whole blood. It was warmed and revived, but was very weak and died shortly thereafter.

BPRD researchers consider it somewhat remarkable that it could revive at all under the conditions.

** Dr. Harold Waitz has continued to improve his surgical platform, mentioned in an earlier edition of BAY AREA UPDATE, incorporating the 3-way stop-cocks onto the surgical stage. This will also be done with the EKG leads and the respirator mask. He and his BPRD research colleagues will now be able to detach the hamster from its life-support systems following cardiac arrest at the ice-point, and move it to an environment fully enclosed in crushed ice, insuring maintenance of whole body deep hypothermia.

** At the October Conference in New York of the American Aging Association (AGE), as explained earlier in the discussion of BACS-Trans Time publicity events, Paul Segall presented his research involving delayed aging. Also attending the Conference were life extension activists Saul Kent, Dr. Greg Fahy, and Dr. Ward Dean. Patrick M. Grady, Jr., a well-known science writer (who wrote The Youth Doctors and co-authored the best-selling Pritikin Program for Diet and Exercise) has been appointed Vice-President of AGE. He is a strong supporter of the life-extension movement.

AGE has received \$120,000 as a result of fund raising efforts by authors Durk Pearson and Sandy Shaw.

** Following a lecture at U.C. Berkeley in August, Paul Segall was able to engage in dialogue with Dr. John Gurdon from England's Cambridge University about his pioneering research in the field of amphibian nuclear transplantation. This process involves the cloning of whole frogs using nuclei from intestinal tadpole cells, as well as developing tadpoles from nuclei harvested from adult skin cells.

This is only a smattering of the items contained in the BPRD report to FEEL, but perhaps it is enough to show that life extension marches on in the San Francisco Bay Area.

Saving Money for Cryonic Suspension.

Pointing out that we cryonicists "have a strong stake in our mutual prosperity," BACS President Jack Zinn has started a column entitled SAVE YOURSELF. He describes the column, which will be appearing in the BACS NOTEBOOK, as "a forum for the exchange of money-saving ideas." He encourages reader input.

The first issue of the column discusses ways to save on postage. Sample item: ungummed postage--i.e., postage which for various reasons has lost its adhesive--can be purchased for up to 50% of face value and can be used by means of inexpensive gluesticks. Very useful info for anyone who does mass mailing.

Saving Your BODY for Cryonic Suspension.

Rather not be eviscerated or otherwise hacked up before you are suspended? Jack Zinn, who is an attorney, also provided a copy of a recent California ruling concerning autopsies and religious beliefs, and a form certifying that one's religious beliefs would be violated by autopsy.

After reading these, I realized that my religious beliefs would indeed be violated by autopsy. I intend to fill out and file one of the forms so certifying.

Quaife Publishes Mind-Blower.

I got high while reading an article by Trans Time President Art Quaife in the latest issue of FACS NOTEBOOK. No chemicals involved. Not necessary. Just following Art's discussion was enough. The brief article, entitled COMING SOON. . . THE WRIST LOGIC COMPUTER, takes the reader on a swift tour--part history, part prediction--from the bulky, room-sized computer of the 1940's to the wrist-watch-sized logic-processing computer of the future which will:

** Respond in synthesized English with solutions to complex problems presented to it in spoken English.

** Yield to computers equivalent to "our currently most powerful (Cray) computers" and yet "fit into your earlobe with much room to spare."

Meanwhile, Art predicts, "genetic engineering and the use of other molecular machinery will soon begin evolving the human race--and us, the living--into a higher species, if only we manage to stick around.

"Let us all stick around and savor the benefits all around."

Editorial comment: I intend to.

SCIENCE UPDATES

by Thomas Donaldson

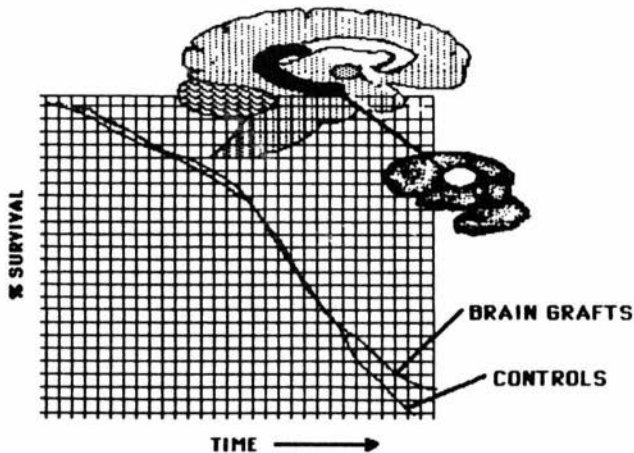
FETAL BRAIN TISSUE, AGING, AND MEMORY

By now, most cryonicists, and certainly the readers of CRYONICS, will have heard of the studies of brain grafts in rats by Bjorklund, Dunnet, and others (cf for instance S.B. Dunnet et al BRAIN RESEARCH 251, 335 (1982)). In brief, these studies have shown that injections of fetal brain cells can cure or improve the results of surgical brain damage. They have also shown that similar brain grafts can improve the motor coordination of aged rats (SCIENCE, 221, 966 (1983)).

An even more interesting paper (SCIENCE, 225, 533 (1984)) by some of these authors has just appeared, suggesting that injections of fetal brain cells can not only improve the memory ability of the aged, but also their longevity. Dunnet, Bjorklund et al report their results in testing this treatment, injecting fetal brain cells, on aged rats with impaired ability to learn spatial problems.

They studied both aged and young female rats. The test they used to measure the rats' performance consisted of dropping them into a maze filled with water, which they had to find their way out of, swimming all the way. They began their studies by first testing all their aged rats, and selecting for treatment only those rats which showed impaired memory. They treated half these impaired rats and left the other half as controls. Their treatment consisted of injecting fetal nerve cells into the hippocampus region of the old rats. They prepared this suspension of cells from the similar region in the brains of fetal rats.

After 3 months, they tested their treated rats. Treated rats actually performed better on average than old controls who were not impaired! Not every treated rat improved, however; one rat did nothing but swim in a circle, and so was removed from consideration. There were 11 rats in the treatment group and three of them did not improve with treatment.



"Fetal brain grafts affected not only memory, but also survival."

Unfortunately for clean theories of this subject, these experimenters could find no clear difference between successfully and unsuccessfully treated rats in terms of survival of the grafted cells. However, they did find one very interesting difference, perhaps as great as to merit much more attention. All 12 treated old rats survived the 3 months until testing, while only 6 out of 17 of their control, untreated old rats survived 3 months longer. That is, the fetal brain grafts affected not only memory, but also survival. The authors gave no suggestions as to why this may be so.

Present political conditions would prevent any similar experiments upon human beings. One way or other, the barriers to such a treatment will eventually be overcome; unfortunately, that event may take many person-millenia of senility.

LEUKOTRIENES AND BRAIN ISCHEMIA

Cryonicists who suffer from asthma may recognize the leukotrienes, or "slow-reactive substances" (SRS's) as the substances responsible for some of the contraction of the bronchial tubes. An interesting paper in *SCIENCE* (224, 886 (1984)) by M.A. Moskowitz et al presents evidence that leukotrienes may also be behind the vascular contraction which happens when brains are deprived of blood flow.

Moskowitz et al studied gerbil brains subjected to ischemia. They found that leukotrienes appeared in the gerbil brains after only 5 minutes of ischemia and became more marked as time passed, and continued to increase after reperfusion. After 15 minutes of reperfusion, levels of leukotrienes did stop increasing and started to fall. By experimenting with isolated blood vessels they were also able to show that the leukotrienes actually came from the brain cells, rather than from the blood vessels. Detailed study of their results suggested to them that leukotrienes came either from the neurons themselves or from some kinds (but not all kinds) of glial cells.

Leukotrienes not only constrict blood vessels, but also cause an increase

in permeability. Water from these blood vessels can therefore get out and cause swelling of the brain, which again cuts off circulation. Other substances, such as the prostaglandins, also occur in ischemia, causing constriction and loss of circulation; however, drugs such as indomethacin, which counteract the prostaglandins, do not help prevent the effect of the leukotrienes.

As yet, we have no good drugs to prevent this effect. Theophylline, given to prevent action of the SRS in asthma, may help a little, but probably won't be very effective. On the other hand, the connection with asthma suggests that even without an interest in brain ischemia, much better drugs to prevent swelling due to leukotrienes are on the way.

WHY PERFUSATES MATTER

Several years ago, the cryonics journals carried extensive discussions of perfusate composition. The insight that lay behind these discussions was that the exact chemicals that were contained in our perfusates could greatly affect the survival of frozen cells and tissues. It doesn't just matter what cryoprotectant you use, you need to choose the other components of the solution too.

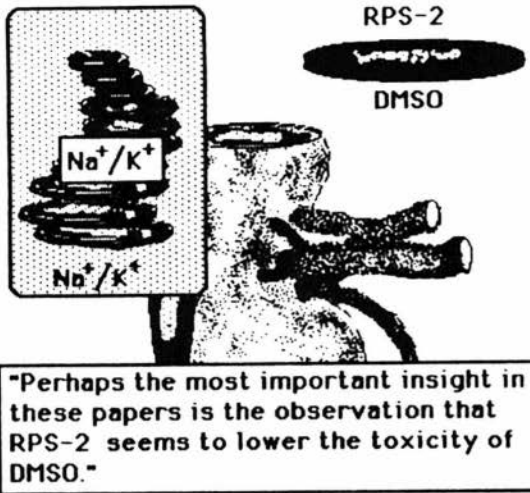
Recently, CRYOBIOLOGY (21, 260-284 (1984)) has published two papers by G.M. Fahy, A.M. Karow Jr., and P. Clark describing their work on the details of how perfusates can alter the toxicity and effectiveness of three different cryoprotective drugs. All of this work was done more than two years ago; I believe that it has already affected practice in the major cryonics facilities. However, a brief review may help put it into perspective for those who aren't actually involved in doing suspensions.

Fahy, Karow, and Clark studied the response of kidney slices to three different perfusates combined with three different cryoprotectants: dimethyl sulfoxide (DMSO), glycerol, and ethylene glycol. Their perfusates were Krebs-Henseleit solution (K-H), another which they called Solution A, and a third which they called RPS-2. Their paper gives the exact compositions of these solutions. Without describing composition in detail, RPS-2 contains a large amount of glucose and no sodium chloride. Solution A contained a relatively large amount of potassium chloride.

Since they were studying kidney slices and not even whole kidneys, they assessed "viability" on a very basic level, by studying the ability of the kidney cells to maintain the right ratios of potassium and sodium. This tests whether or not the cell membranes were working.

These different perfusate compositions did cause marked differences in the behavior of the cryoprotective drugs. The solution RPS-2 caused DMSO to enter the cells more rapidly than the K-H solution. After 70 minutes, the difference between K-H solution and RPS-2 was quite marked. RPS-2 caused an initial decrease in "viability" (measured by potassium:sodium ratio), but after that, the cells reached a stable plateau, remaining there for as long as two hours. The other solutions caused a continual decrease in "viability."

Perhaps the most important insight in these papers is their discussion of RPS-2. RPS-2 seems to lower the toxicity of DMSO. Cryobiologists have known for a long time that DMSO is toxic to cells in the concentrations needed to



protect them against freezing. This toxicity prevents us from raising the concentration of DMSO as high as we would like for full protection. Any perfusate which would decrease this toxicity would interest us a lot. Fahy, Karow, and Clark suggest that the reason for this decrease in toxicity is glucose, which may interact with DMSO. The RPS-2 solution contained glucose, while the others did not. One possible cause of toxicity for DMSO is that it becomes chemically bound to albumin. Albumin is present not just in eggs, but in blood and many other tissues. Albumin is a protein, and DMSO probably binds to other proteins too.

The papers contain a great deal of other detailed data. This is not the place to discuss this data; however, the central point, that the exact composition of perfusate may very significantly affect the behavior of our cryoprotectant, is important and worth understanding by every cryonicist.

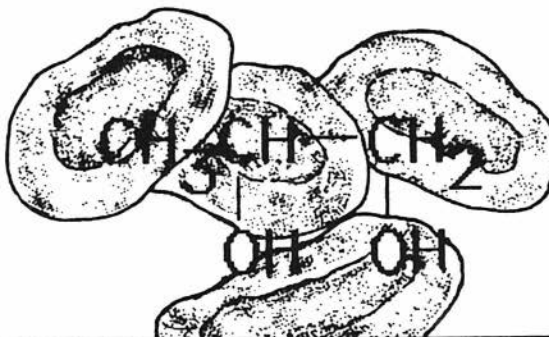
STUDIES OF A NEW CRYOPROTECTANT

Pierre Boutron, a French physicist who has written a popular book (in French) in favor of suspended animation, has also done some intensive studies of cryoprotectants. His work has begun to make significant progress towards finding better drugs than the existing "dynamic duo" of glycerol and DMSO. Recently in CRYOBIOLOGY, Boutron and F. Arnaud have published their studies of the survival of red blood cells after freezing with one new cryoprotectant, propylene glycol, and how this drug compares to glycerol (CRYOBIOLOGY, 21, 348, (1984)).

The aim of Boutron's work has been to find a drug which, when frozen with water, will form a glass much more easily than the existing drugs. This is important because ice crystallization may cause very significant damage to frozen organs or any structured assembly of cells. Fahy and Hirsch, in particular, have written extensively on method to vitrify organs rather than freezing them: that is, to cause the water in these organs to form a glass as it cools, rather than an ice. In their papers, Fahy and Hirsch spend great efforts in considering some very ingenious means to vitrify organs. Their methods involve using such things as very high pressure combined with other special drugs to protect against the high concentrations of drug needed for vitrification. All of these efforts might become unnecessary with a drug which vitrified more readily; and even if additional measures such as pressure were still needed, these measures might not have to be so extreme. The extreme measures Fahy and Hirsch had to consider of course raised many problems of their own, and any way to avoid them would have a lot of importance.

Up to now, Boutron and Arnaud have only considered the physical behavior of

their solutions. Their recent paper is the first attempt to test just how well their cryoprotectant works with a biological system. Fundamentally, their results come down to this: propylene glycol causes a higher survival rate after freezing red blood cells than does glycerol.



"The aim of Boutron's work has been to find a drug which, when frozen with water, will form a glass more easily than existing drugs."

In detail, after slow freezing, and with the same proportions by weight of propylene glycol versus glycerol, and the same freezing rates, more red blood cells survived with propylene glycol than did with glycerol. At much higher cooling rates, for both cryoprotectants, survival rates decrease and then increase again. The minimum survival point occurs at a lower cooling rate with propylene glycol than it does with glycerol.

Their study is only a study with red blood cells, and we all know that it's a great distance from red blood cells to brains. Nevertheless, the paper gives me a strong feeling that Boutron's work has begun to bear significant fruit.

HUMAN GENE THERAPY

For a long time, cryonicists have dreamt of finding means to alter the genes in our body cells. By doing that, we could redesign ourselves, fixing our inborn illnesses and faults and improving ourselves beyond the best of humanity today. Only a few years ago, this possibility seemed very distant. I can remember how only ten years ago scientists claimed this possibility was so far in the future that we could forget about it.

However, the possibility of altering genes in a living person has now become very real. We'll have to accept that it's still at a very primitive stage. Furthermore, just because it's a real possibility, scientists have a far better idea of what the difficulties of such a redesign might be. The usual apes wanting to forbid these techniques, trying to make certain by force that they are the pinnacle of evolution, have also come down from the trees to plague us too. A recent article in SCIENCE (Anderson, W.F., SCIENCE, 226, 401 (1984), "Prospects for Human Gene Therapy"), has described all of these possibilities, both telling us current ideas for how to do gene transfer and suggesting further ideas for the future.

For those who have hopes of discovering means of immediately turning ourselves into homo quintus, Anderson has several comments about present difficulties. They tell us that such changes may be far more complex than it may seem.

The reason why it is complex is because we can't simply insert most genes into our cells and expect a useful result. Genes are regulated by still other

genes; our genes are normally turned on or off depending on their location and the condition of our body. All of this can become deranged if we simply insert the genes into body cells. For instance, recently scientists inserted the genes for rat growth hormone into dwarf mice. This gene did produce growth hormone: it turned the dwarf mice into giant mice, one and a half times as large as a normal mouse. What happened was that the gene produced TOO MUCH growth hormone. By now several animal experiments have suggested the kinds of things which can go wrong. Genes can make too much of the right chemical; they can also go into the wrong cells, as in one experiment where the beta-globin gene, normally in bone marrow cells, settled in muscles and testes instead. Several experiments have produced quite new and novel forms of pathology by this means. Most likely, however, is that the gene won't act at all; although it successfully finds its way into body cells, the cells spontaneously "turn it off", preventing it from expressing itself in any way. Most gene transfers turn out this way.

To add to the complications of a thorough genetic "redesign," most traits depend not on a single gene, but on a whole family of genes, often on different chromosomes, and all interrelated and interregulated. Inserting a single gene and having it work successfully is only a first step toward the kind of redesign we want, and this first step hasn't yet happened, although it may soon happen for some restricted kinds of genes.

Many readers may remember the problems of Martin Cline, who attempted to cure thalassemia, an inherited blood disease, by inserting a replacement gene into the bone marrow of a woman suffering from the disease. Not all acts which are appropriate and moral, however, are successful. Since that time, the prospects for curing thalassemia have receded. The problem is that regulation of the globin genes which are defective in thalassemia is very complex. To be successful, any gene insertion needs proper regulation.

However, there are much simpler genetic defects for which problems of regulation shouldn't arise. They stem from a defect in a single gene which doesn't have a a complex form of regulation. Among these are Lesch-Nyhan disease, which causes mental deficiency and self-mutilation, and results from failure to produce a single enzyme, (hypoxanthine-guanine phosphoribosyl transferase, or HPRT. Two other genetic defects are also good candidates. Both of these cause severe deficiency of the immune system, one because of the absence of the enzyme purine nucleoside phosphorylase, or PNP, and the other because of the absence of adenosine deaminase, or ADA.

At present, scientists know only how to insert genes into bone marrow cells and skin cells. Unfortunately, the mental deficiency of Lesch-Nyhan disease stems from lack of the enzyme HPRT in the brain, one organ no one yet knows how to affect by genetic therapy. However, other faults come to light from the lack of HPRT in the bone marrow, which should be curable by the right gene insertion. The other two diseases could possibly be nearly or completely cured by gene therapy.

Anderson discusses several techniques which may prove useful. Some of these are very crude. For instance, we can individually insert the the needed genes into individual cells, more or less by hand! However, the most interesting technique, and the most suggestive for future modifications, consists of the use of specially reconstructed viruses.

The principal viruses in question are called retroviruses. These viruses

carry their genetic information on RNA (unlike our own cells, which carry it in DNA). They reproduce by inserting themselves into a cell, producing a DNA which mirrors their own RNA, and inserting this DNA into the chromosomes of the host cell. The host cell will then proceed to produce many copies of the virus rather than of itself. By now, scientists understand fairly well the exact working of a retrovirus, how it manages to do this, the enzymes involved, and how they are regulated.

Any reader can see the immense technological possibilities involved in retroviruses! First, we can produce retroviruses

which contain RNA coding for the DNA of one particular gene. The retrovirus will then insert the proper DNA into the chromosomes of a host cell. That is, we can use retroviruses to insert new genes into cells. Of course, this would do nothing if the retrovirus simply produced copies of itself. However, we can prevent this by removing some of the viral RNA which codes for vital steps by which the virus forces the host cell to copy it. The defective virus will then insert genes into a host cell, but will never force its own reproduction. How can we then produce MORE such viruses? By infecting the host cells with another defective virus, this time one which can't insert genes, but which can make a cell create more viruses. That is, we create an integrated system consisting of two modified retroviruses, one of which can insert genes into cells, and the other a helper virus which helps the first virus to reproduce. Once we have created enough viruses of the first type, we can then infect bone marrow cells with it. The insertion virus will insert the desired gene into the infected bone marrow cells.

This isn't just a plan of action. It's been done. The viral system involved is a modified form of a mouse retrovirus, called the Maloney murine leukemia virus.

Like any real invention, this system needs work on several lines. The locations into which an insertion system puts a gene aren't presently controllable. Furthermore, the existing insertion systems are unreliable: the genes aren't always inserted. Sometime the retrovirus rearranges the gene, so it doesn't come out right. Furthermore, we would often want to insert more than one gene as part of a system. This isn't always successful either: sometimes the retrovirus inserts only one gene of several. Retroviruses can only carry and insert short, simple sequences of genes.

Retroviruses can be used to insert new genes into our cells, effectively allowing us to "modify" ourselves.



Nevertheless, this is certainly a start. Scientists were able to make this start, of course, because there already existed a natural system which had some of the properties they desired. There's a very great potential here for modified viruses, bacteria, and other systems which can infect and carry modifications into cells, either intact cells or injured ones. However, the easiest modifications are those already based on an already existing system.

There are several other ways in which we could think about inserting genes into cells. Anderson mentions several DNA viruses also, which would work very differently, but which would achieve the same end. Scientists have already modified one DNA virus, SV40, to insert genes into cells, but work on this method isn't so advanced as the work on retroviruses.

In his article, Anderson has several comments to make about ethics. For some reason, I know of no occasion in which the word "ethics" is used in discussing how "we" can allow "them" to choose for themselves. "Ethics" always seems to be discussed when "we" discuss what "we" will do to or for "them". That appears to be the situation here. I feel that cryonicists won't find Anderson's discussion of ethics very interesting. However, along the way Anderson's does point out some of the dangers of these techniques. For instance, the retrovirus is a mouse leukemia virus and might create a danger of cancer. However, the mouse leukemia virus doesn't normally infect human beings: Anderson feels that using mouse viruses for gene insertion rather than human viruses will keep down any danger of cancer.

Several years ago, Mike Darwin presented his views for an "anabolocyte". This would be an engineered bacterium or white blood cell which would enter and repair damaged cells. We can see in these discussions of methods for inserting genes into cells just how our biological engineering has started to produce systems of just the right kind. We can also get an idea of just what would be involved in creating such a system. Certainly the techniques for genetic modification of living human beings (ourselves) will come, but we can also see that such techniques won't be simple. Scientists will have to learn a tremendous amount to successfully carry out these dreamt-of changes.

"War replaces the difficult gray areas of life with an eerie, severe clarity. In war you usually know who is your enemy and who is your friend, and are given means of dealing with both"

**--William Boyles Jr.
"Why Men Love War"
ESQUIRE**

"Real progress is not a leap in the dark, but a succession of logical steps."

--Robert H. Goddard

FEBRUARY-MARCH 1985 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 PM.

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, 3 FEB 1984) Mike Darwin and Scott Greene
 350 W. Imperial Hwy., #21
 Brea, CA
 Tel: (714) 990-6551

DIRECTIONS: Take the Orange Fwy. (Hwy 57) to Imperial Highway (Hwy 90) and go west through Brea on Imperial Highway. 350 is about one mile from the freeway and in the third block beyond Brea Blvd., on the south side. If the gate is closed, park on the streets north of Imperial. Be careful crossing Imperial. There is a blind curve to the east and a blind hill to the west at this point.

The MARCH meeting will be at the home of:

(SUN, 3 MAR 1984) Sherry Cosgrove
 3100 Palm Drive, #1
 Fullerton, CA
 Tel: (714) 993-3376

DIRECTIONS: Take the Orange Fwy. (Hwy 57) to Yorba Linda Blvd., just north of the CSU Fullerton campus. Go east on Yorba Linda to the second stop light (Placentia Ave.). Go north (left) on Placentia, around to Palm Drive. Turn right on Palm. 3100 is an apartment block immediately on the right, behind the K-Mart parking lot, and is not numbered. #1 is at the corner of the street and the parking lot.

The APRIL meeting will be at the home of:

(SUN, 7 APR 1985) Maureen Genteman
 324 Raymond Avenue
 Santa Monica, CA
 Tel: (213) 392-2137

DIRECTIONS: Take the Santa Monica Freeway (Interstate 10) to Santa Monica and get off at the Olympic/Lincoln exit. Turn south (left) on Lincoln. Go south on Lincoln to the 2800 S. block, just before Raymond. Turn west (right) on Raymond.

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