

# Cryonics: An Historical Failure Analysis

Part II: Inherent Failure Mechanisms and Risks

Mike Darwin



1972-1991

## AWAKENING TO REALITY



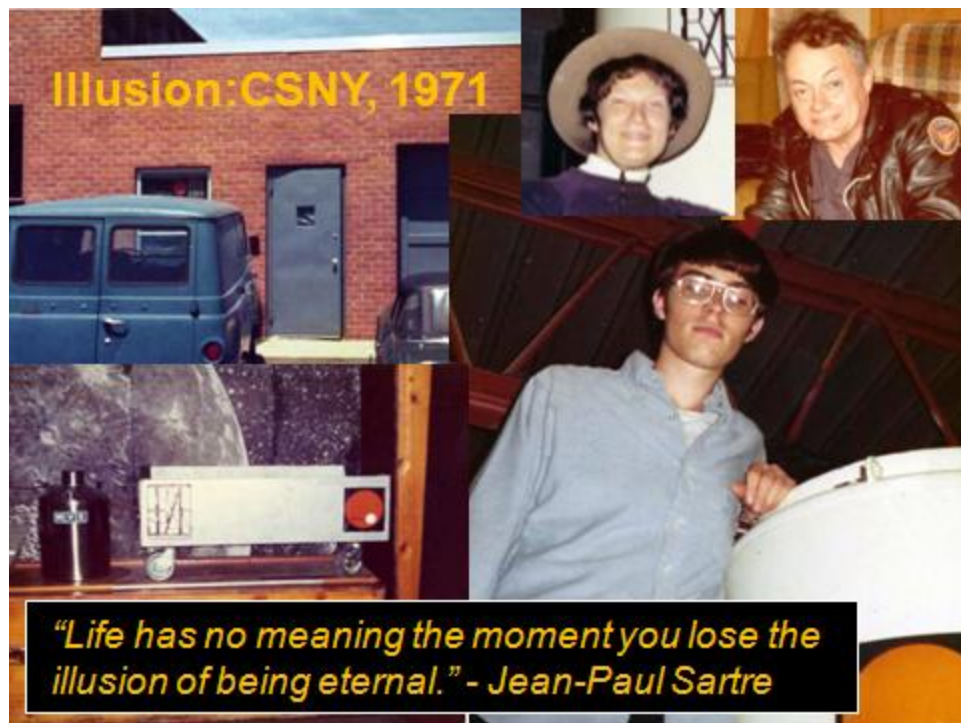
### SLIDE 96

As I said in the previous lecture, the literature produced by CSNY created an impression of competence and of the presence of a solid organization.

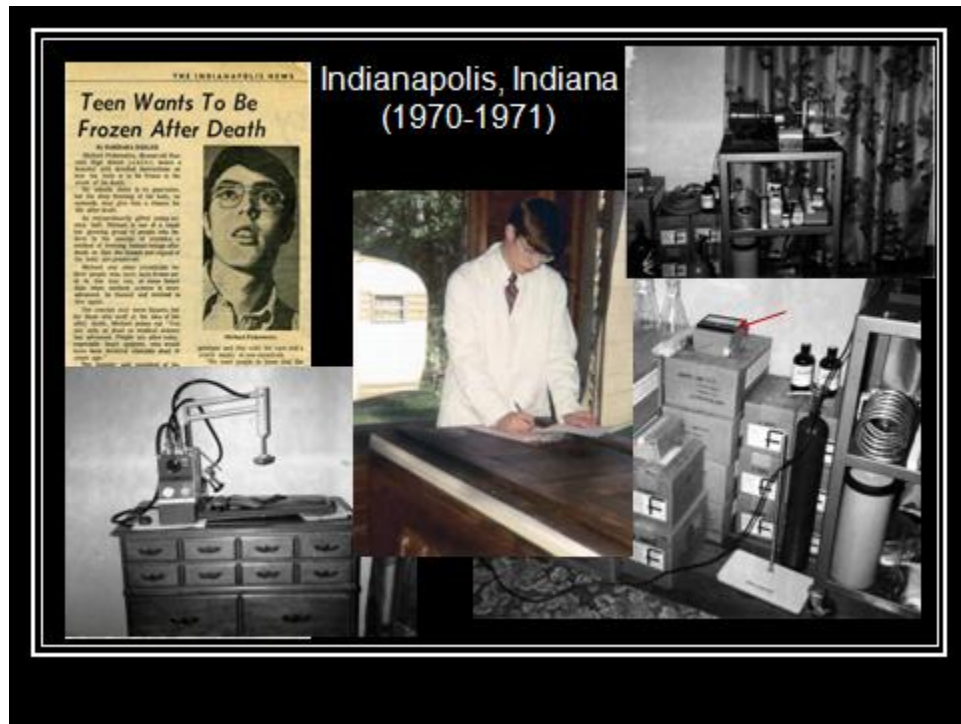
After I had been involved in cryonics for a little over a year I began to hear rumors that CSNY was not being run honestly and that, in particular, the patients were not being stored submerged in liquid nitrogen and that their heads and upper bodies were well above dry ice temperature. There were other rumors and accusations as well. The source of these turned out to be Robert Nelson, and after a great deal of difficulty I managed to speak with him by phone.

## GOOD ADVICE

Nelson's charges prompted me to call Curtis Henderson and to 'confront' him with Nelson's accusations. Henderson's response was simply to invite me to come and see for myself. He explained that it was impossible to answer accusations of the kind Nelson was making in any meaningful way short of seeing first-hand what conditions were and spending time with the people to whom I had entrusted my life. I was 14 years old at that time and I doubt very much if Curtis expected me to take him up on his offer – even though it was clearly sincere.



However, that is exactly what I did. I took a part time job to pay for my plane ticket and I showed up on CSNY's doorstep the summer after that phone call.



## SLIDE 98

The image of solidity and professionalism projected by CSNY's literature was tempered substantially by my having visited CSNY during the summers of my 14th and 15th years (yes, I went back). I was well aware that the storage facility was small and that the resources of the organization were minimal. For that reason, and because of the geographical distance, I began to accumulate the equipment and supplies required to carry out cryoprotective perfusion and cooling to dry ice temperature. I also began efforts to recruit others into cryonics.

By late 1971 I had acquired all the equipment and chemicals I believed were needed to carry out the pre-liquid nitrogen phases of cryopreservation. One of the most costly items, and one which I had to purchase new, was a thermocouple thermometer, pictured sitting atop cases of Ringer's solution and indicated by a red arrow.

By 1972 the war of words between CSC and CSNY had reached fever pitch. One of the charges being made by CSC was that Curtis Henderson was storing patients improperly and that their heads and upper bodies were, in fact, well above dry ice temperature most of the time.

In December of 1972, Greg Fahy and I journeyed from my home in Indianapolis, Indiana to visit CSNY and actually measure the temperature at the top of the MVE dewars, as well as at various points on the patient then in storage and so the TC meter in this picture was taken along on the trip.

Note the character and quantity of the equipment and supplies I had accumulated in Indianapolis: at left the Westinghouse Iron Heart; center, a dry ice box; upper right, roller and centrifugal pumps; lower right, Ringer's solution, DMSO, stainless steel heat exchanger, bubble trap, formaldehyde for sterilizing the perfusion circuit, perfusion circuit, pH paper, liquid measuring equipment...

The Beginnings of *Cognitive Dissonance*  
Clara Dostal, 10 December, 1972



*"A condition of conflict or anxiety resulting from inconsistency between one's beliefs and one's experience of reality."*

SLIDE 99

The morning after Greg and I had arrived at the CSNY facility, we were awakened by Saul Kent, who informed us that a CSNY member, a woman named Clara Dostal, had just been pronounced legally dead and that, since we were 'experts' in the area of cryoprotection and perfusion, we should take charge of the case and perfuse the patient. This was the beginning of a period of agonizing cognitive dissonance for me (I cannot speak for Greg Fahy).

Desperately Attempting to Provide Good Care  
Clara Dostal, 10 December, 1972

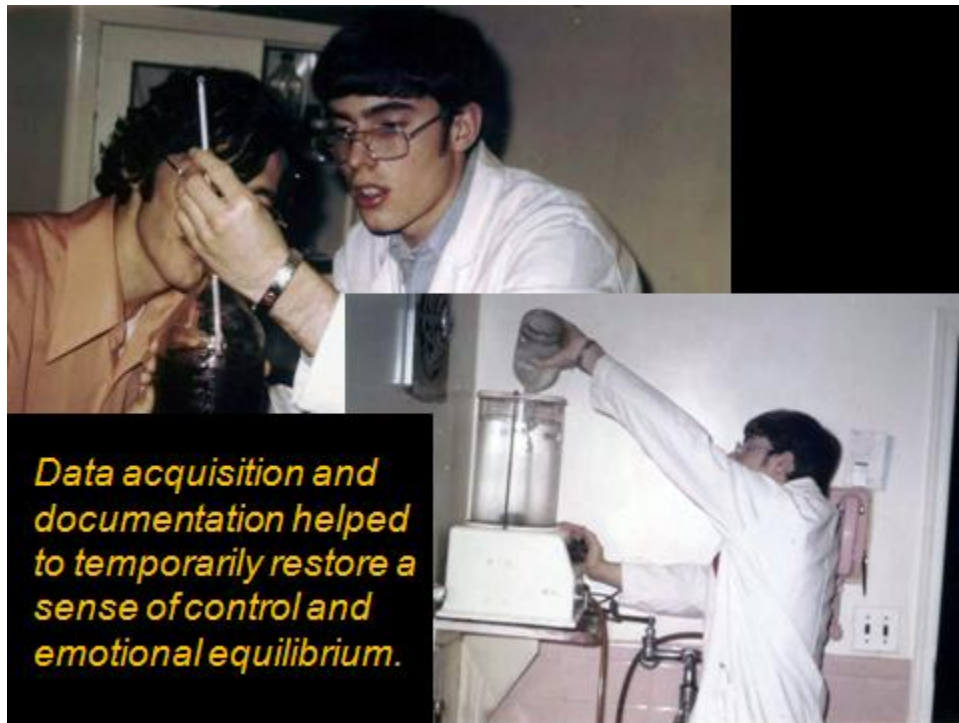
*Collecting  
effluent  
samples for  
subsequent  
analysis.*



SLIDE 100

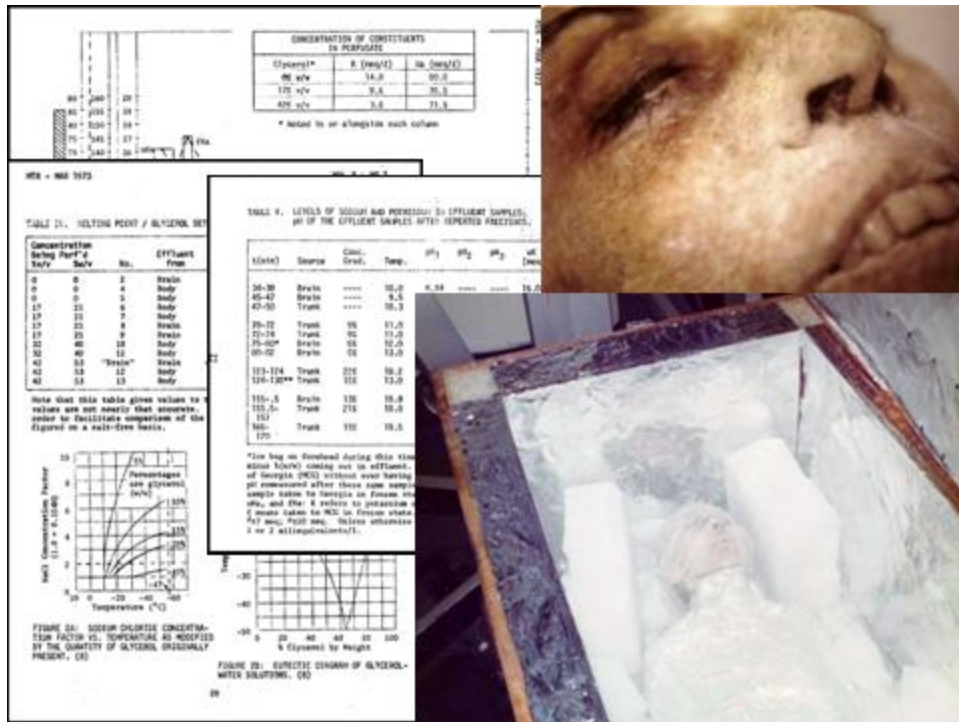
Prior to this, perfusion and cool down as practiced by CSNY had been a black box to both Greg and me. We assumed that this procedure was carried out in a 'scientific' manner and that the CSNY mortician Fred Horn, working with their biologist Paul Segall, were implementing some kind of reasonably professional and standardized care – even if it was not very sophisticated. In this we were sadly mistaken. To my horror I discovered that not only was I better prepared to perfuse and freeze patients in Indianapolis, but CSNY neither owned nor had access to a graduated cylinder for measuring out the volume of cryoprotective agent to be added to the Ringer's carrier solution! We were forced to measure out the glycerol to be added to the Ringer's carrier solution by using an empty Ringer's solution bottle. The approximate liquid volumes

molded into the glass of these IV bottles had to serve in place of an accurate measuring cylinder.



## SLIDE 101

Even more surprisingly, we discovered that CSNY had no way of measuring temperature. The only thermometers at our disposal were the ones we had brought with us. There *was* no established protocol, no dedicated equipment, no data collection and no monitoring or observation of the patient *at all*. I was appalled and deeply shaken. For the first time I realized on *both an emotional and intellectual level* that cryonics had truly failed. Certainly, in the form I found it, it had no chance of success.

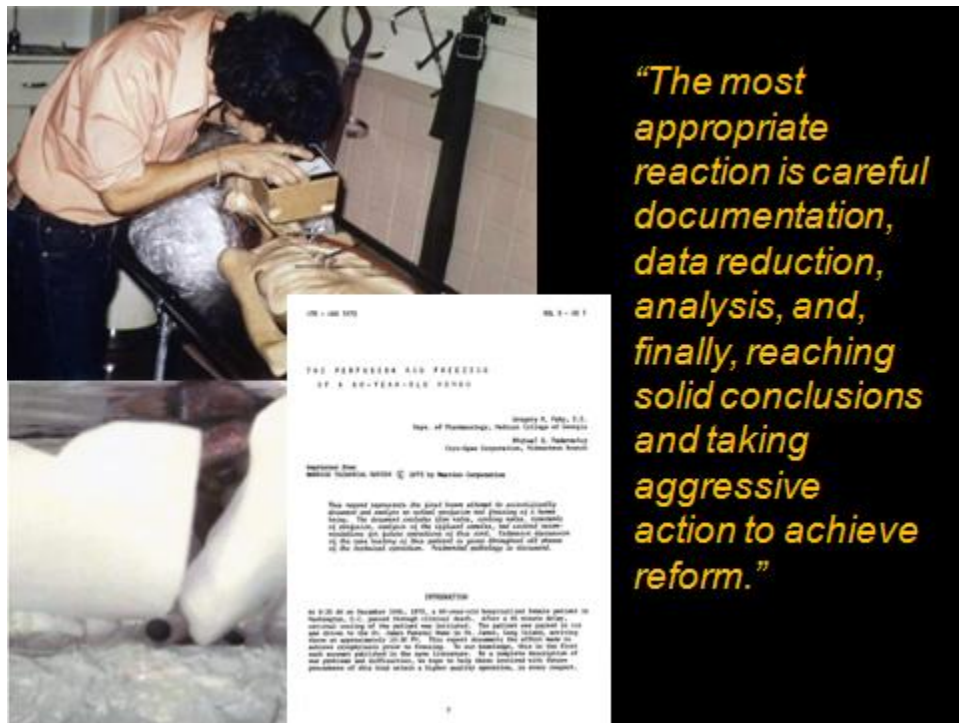


## SLIDE 102

Greg and I did what we could. We carefully measured every parameter it was possible for us to measure on site, such as patient and perfusate temperature, perfusate glycerol concentration, arterial flow rate, patient cooling rate, and so on. We also collected effluent samples from the patient and divided them such that one set would remain with the patient (bottles seen at lower left in the next slide) and the other set would be taken back with us for physical and biochemical analysis (CPA concentration, pH, electrolytes, tissue specific enzymes, etc.).

The TC thermometer we had brought with us from Indianapolis proved essential for monitoring the patient's internal temperature during perfusion as well as her temperature as she cooled to dry ice temperature. The

objective was to thoroughly document her care and make recommendations for changes in the future. We both felt strongly that future patients should benefit from the knowledge and experience gained from this (and every) case.



## SLIDE 103

The paper we produced appeared in the March, 1973 issue of *Manrise Technical Review*, a publication produced by Alcor's brother for-profit organization, Manrise Corporation, which was edited by Fred and Linda Chamberlain.

## Mike Darwin and Clara Dostal (1972)

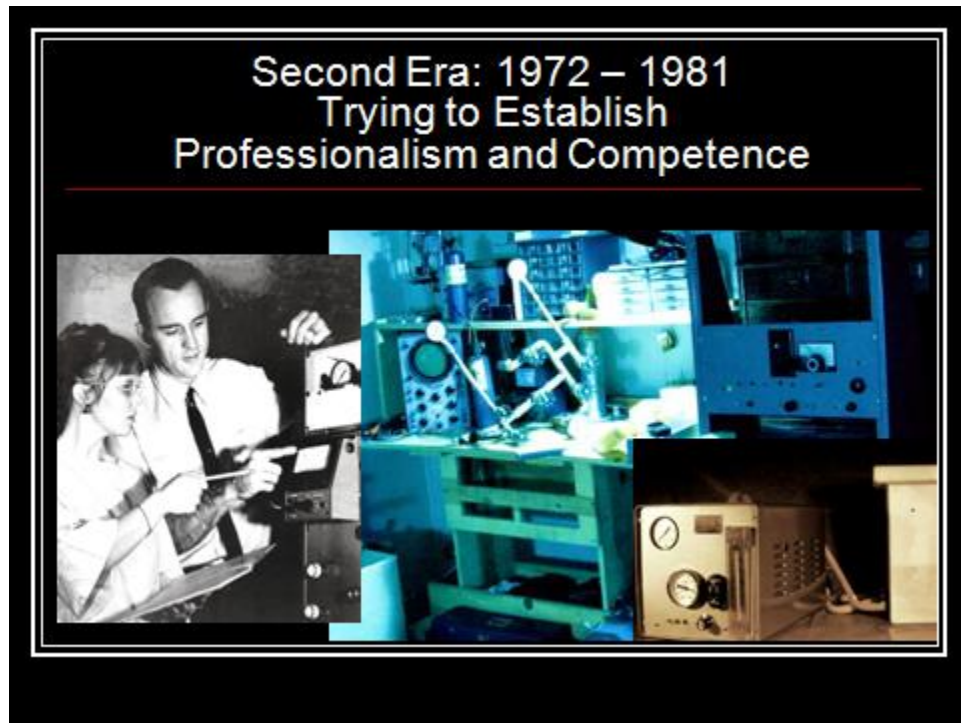


*"Anger replaced fear, and a relentless commitment to rapidly improve conditions replaced near total paralysis of will"*

### SLIDE 104

My experience perfusing and freezing Clara Dostal left me deeply anxious and profoundly dispirited. It took several weeks before anger replaced fear, and a relentless commitment to rapidly improve conditions replaced a near total paralysis of will. In no small measure this experience led to me seek out others who shared my vision of cryonics as a competent, well run undertaking based on a scientific and medical model in the context of good business practices.

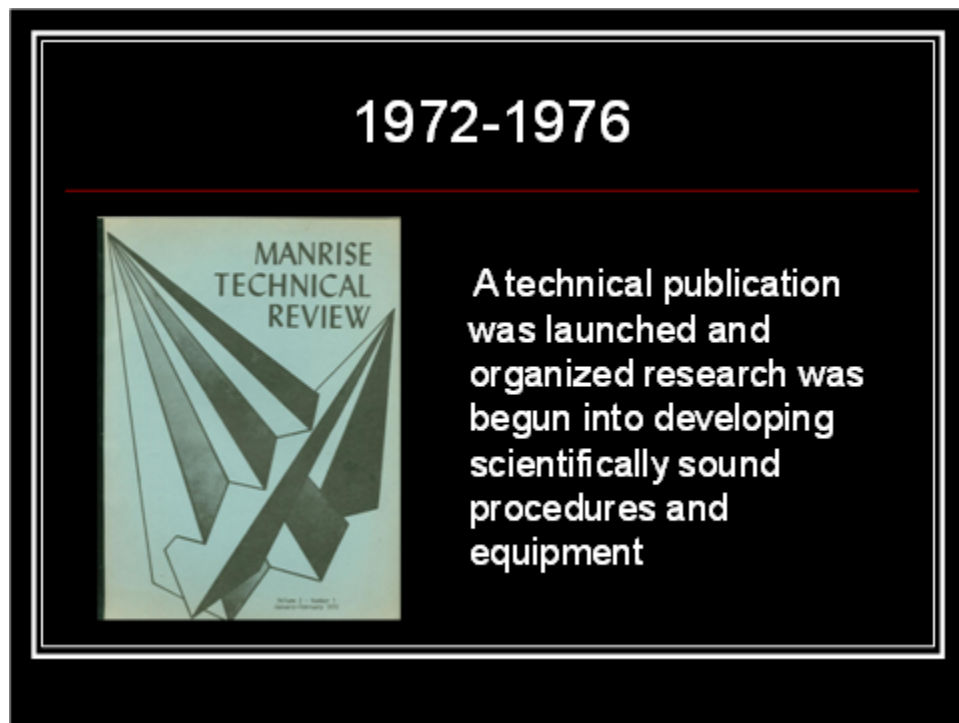
## CRYONICS' SECOND ERA: 1972-1981



### SLIDE 105

This led me to connect with Fred and Linda Chamberlain in Southern California. Following my trips to CSNY, I set out, again with Greg Fahy, to try to determine the state of cryonics on the West Coast. What we found there, or more precisely what we *didn't* find, was even more disturbing than what we had seen and experienced at CSNY. While Greg did not share my opinion, let alone my conviction, the trip to Southern California had convinced me that CSC's patients had been badly mishandled and that in all likelihood they had been thawed out and buried or cremated. This conviction was shared by Fred and Linda, with whom I formed strong and immediate bonds.

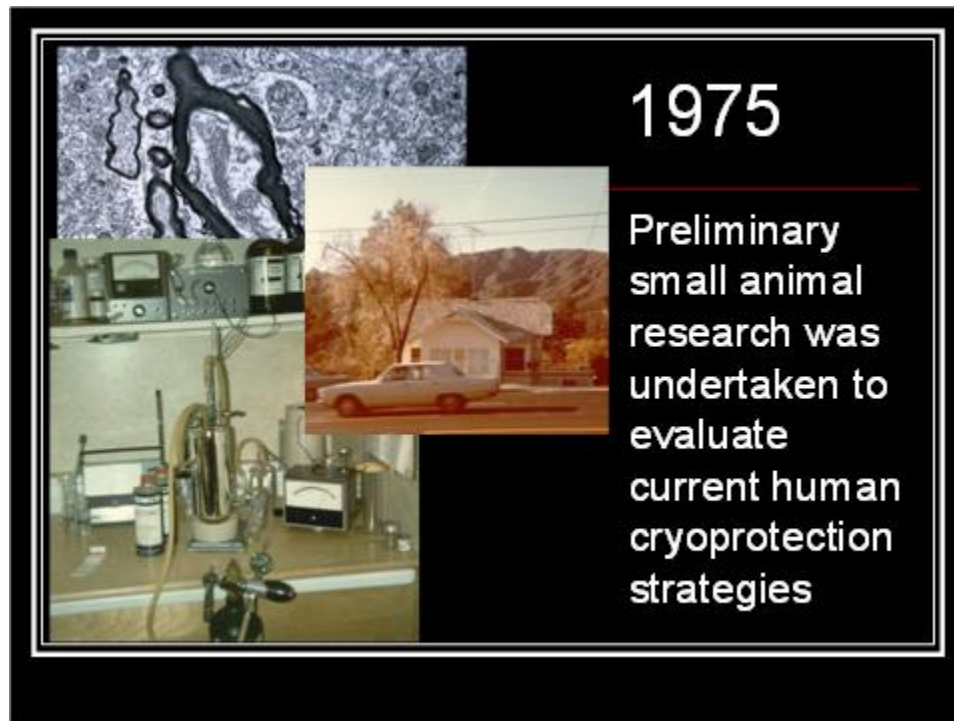
Fred and Linda, like me, had come to realize that cryonics was an abject failure and, with painful slowness, they had begun the process of creating facilities to provide for rescue, stabilization, perfusion and storage with two new organizations: the Alcor Life Extension Foundation, and Manrise Corporation.



## SLIDE 106

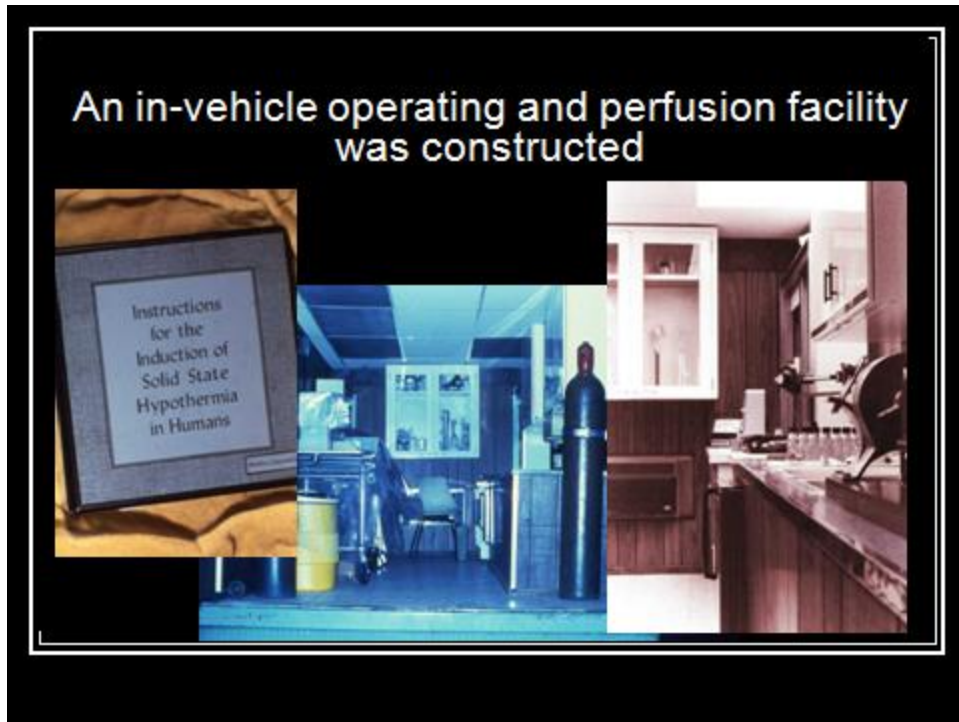
We began to scour the scientific literature for information to allow for development of a rational cryobiological approach to care, and where possible experts in medicine and cryobiology were consulted. A technical publication was launched and organized research was begun into developing scientifically sound procedures and equipment – and to document them openly and in as much detail as possible.

## THE BIRTH OF SCIENTIFIC CRYONICS



### SLIDE 107

A modest research and patient cryopreservation facility was set up and preliminary small animal research was undertaken to evaluate then current human cryoprotection strategies.



## SLIDE 108

Since we could not be assured of being able to afford permanent facilities long term, a decision was made to modularize capability and a mobile operating room was constructed using an old laundry van (lorry). Refinements were made to in-house fabricated perfusion and heat exchange equipment and testing of these systems was undertaken to establish reliability and gain familiarity with their operation.

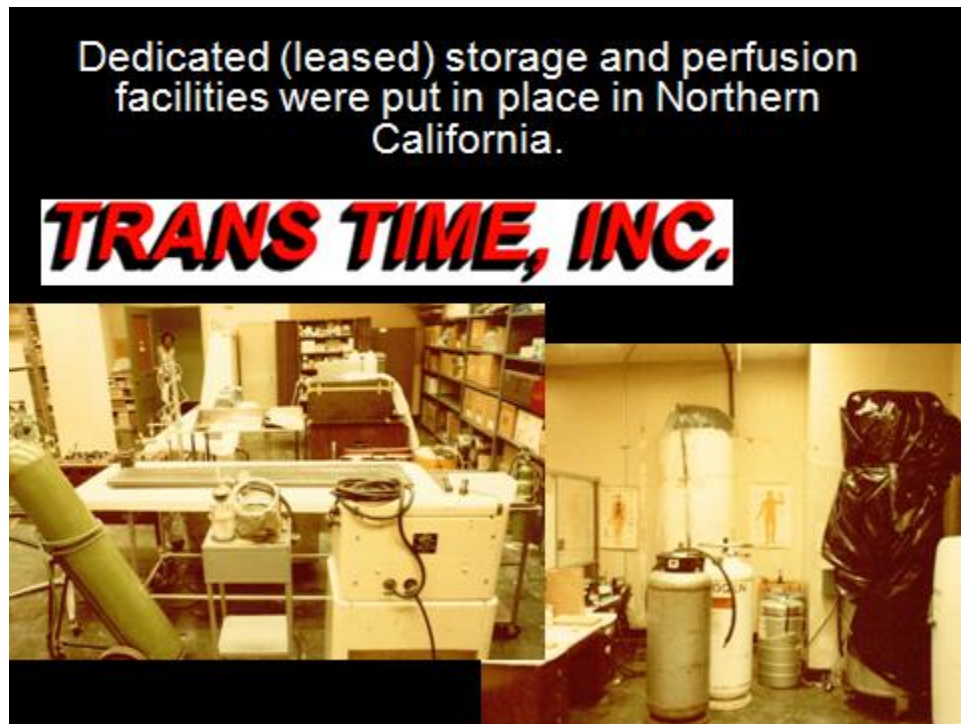
## ***TRANS TIME, INC.***

- Business plans were generated and necessary equipment and consumables were acquired
- Cost analysis and financial and legal issues were extensively addressed.
- A comprehensive program of marketing (Trans Time) coupled with financial incentives for success was undertaken
- Inter-organizational cooperation began and an attempt was made establishing minimum standards of care and self-regulation.

### SLIDE 109

At about the same time, a graduate student in mathematics who lived in the San Francisco Bay Area, Art Quaife, along with an electrical engineer (John Day) and several other interested cryonicists, including Paul Segall, who had relocated to the Bay Area, founded Trans Time, Inc. (TT). TT was similarly focused on 'rebooting' cryonics as a proper scientific undertaking run on sound business principles. TT purchased the technological platform developed by Manrise Corporation for cryoprotective perfusion (including the Manrise perfusion machine, heat exchanger, and procedure manual) and focused primarily on producing the first truly comprehensive business analysis of cryonics. They also did much to clarify nettlesome financial and legal issues.

TT launched the first comprehensive program of marketing cryonics coupled with financial incentives for success, and they also aggressively marketed their stock to educated investors within the cryonics community.



SLIDE 110

Dedicated (leased) storage and perfusion facilities were put in place in by TT in Northern California in 1974.

## First Implementation of Scientific Human Cryopreservation: February 9, 1974



### SLIDE 111

On 09 February, 1974 a decade after The Prospect of Immortality was published and seven years after Dr. Bedford was cryopreserved, Trans Time accepted its first two patients and the first human cryopreservation conducted under something approaching 'controlled conditions' took place. [The Dostal case technically qualifies but it was an ad hoc effort, not a planned undertaking.]

Despite two years of preparation there were many problems with both of these cases. As you can see in this photo, many practical details, such as how to position and anchor the perfusion tubing had not been worked out and improvised solutions were employed. Note the plastic embalming fluid bottle being used as a prop and the tubing

connecting the arterial line to the patient being supported by a length of ligature twine.

Much more seriously, take a good look at the patient. This photo was taken at the end of CPA perfusion (decannulation is underway and some of the refrigerating ice has been removed). Unlike Mrs. Dostal, this patient has become markedly edematous as a consequence of CPA perfusion. This happened because what seemed best in a review of the literature did not work when applied clinically. In this case, a decision had been made to use DMSO instead of glycerol because of the former's superior cellular permeability. Unfortunately, DMSO is quite toxic to the vascular endothelium and this effect is greatly amplified in patients with prolonged ischemic injury. This patient received no cardiopulmonary support and had suffered well over 24 hours of cold ischemic injury.

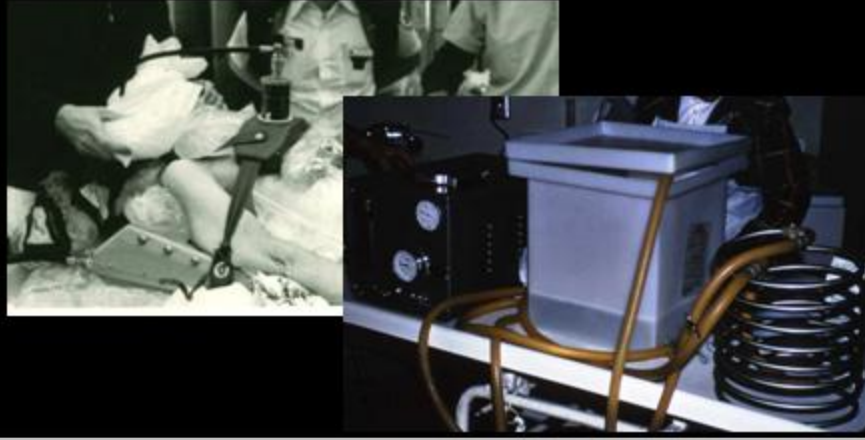
The obvious (but unheeded) lesson was that techniques used on humans must first be evaluated in a suitable animal model under conditions as close to those that are encountered clinically as possible.



## SLIDE 112

While the party line to the media had always been that patient stabilization was begun immediately upon pronouncement, it was not until Fred Chamberlain, Sr., arrested on 16 July, 1976, that this was actually done. The next such case, shown in this slide, took place under the auspices of Trans Time three years later in January of 1979. At the bottom center of the slide a blue plastic case with a small speaker next to it contains an electronic stethoscope with amplifier so that the patient could be monitored continuously and the moment of cardiac arrest determined with precision. This instrument was developed by Fred Chamberlain and me and was first used (successfully) on his father, Fred Jr.

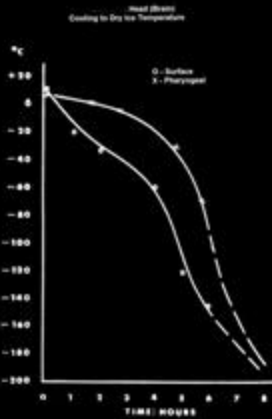
Control over, and documentation of, perfusion temperature, pressure, flow, volumes... was consistently employed, as was measurement of the concentration of CPA in the venous effluent.



## SLIDE 113

At this point, cryonics as practiced by Alcor and Trans Time had become professionalized to the extent that there was control over and documentation of perfusion temperature, pressure, and flow. The volume of perfusate used was based upon complex mathematical modelling of CPA uptake and there was frequent and consistent measurement of the concentration of CPA in the venous effluent. Finally, in-house trained and skilled personnel were available in conjunction with an effective emergency response system (ERS).

Cooling to  $-79^{\circ}\text{C}$  and  $-196^{\circ}\text{C}$  were also documented and brought under some measure of control.



## SLIDE 114

Cooling to  $-79^{\circ}\text{C}$  and  $-196^{\circ}\text{C}$  were also documented and brought under some measure of control. Packing of patients in dry ice to achieve freezing was abandoned and an isopropanol bath was used in conjunction with the measured addition of dry ice in order to reduce the patient's temperature in a controlled manner.

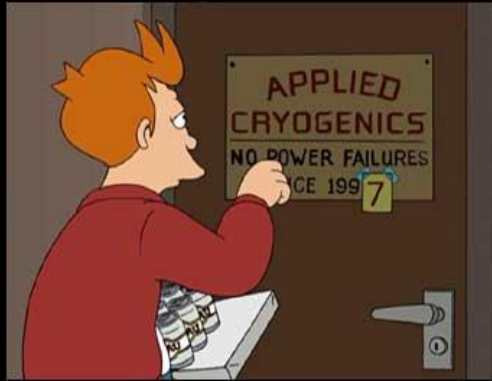
## PAYING THE PIPER



### SLIDE 115

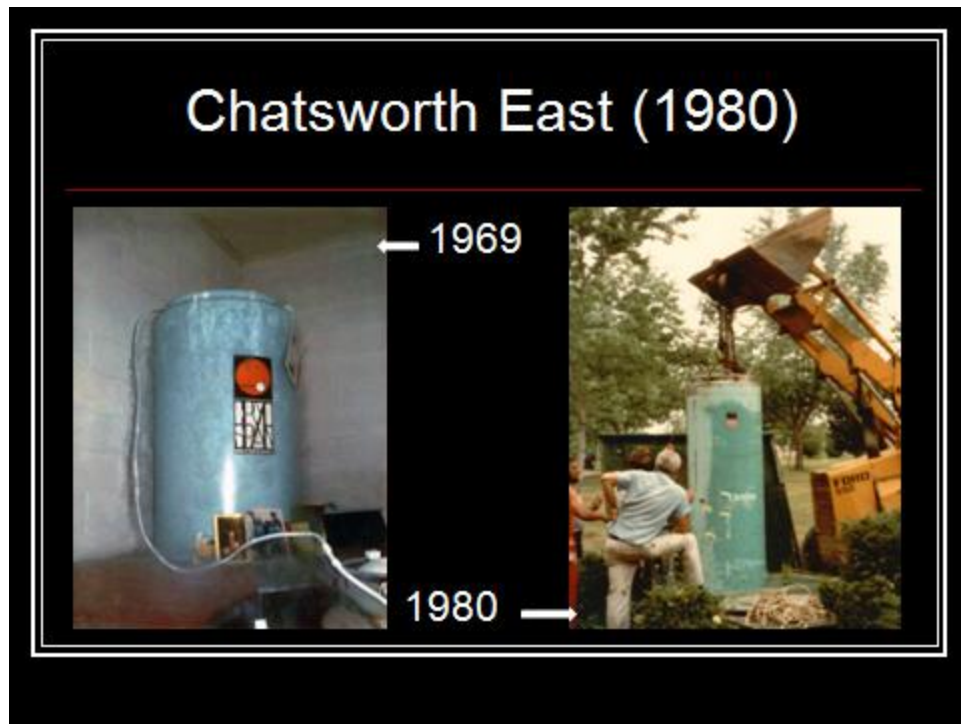
Then, in 1979 the years of deceit and lies which had dogged cryonics from the start came to the fore. The nearly completely decomposed bodies of ten cryonics patients were discovered by an investigative reporter in the facilities of CSC in Oakwood Cemetery in Chatsworth, CA. As I have previously stated, the consequences of this scandal were devastating for cryonics. The story of the initial discovery and the subsequent civil trial that resulted remained an item in the national press well into the 1980s.

Cryonics lost credibility and became the butt of jokes...



SLIDE 116

Cryonics became synonymous with ‘thawed bodies’ and there were countless cartoons and gruesome humor pieces in magazines and newspapers. The loss of credibility and the specter of failure resulting from Chatsworth extend into the humor, as well into the more serious criticism of cryonics today, as evidenced by this still from the animated series *Futurama*. *Futurama*’s creator Matt Groening followed the Chatsworth scandal as a boy and some of his most successful cartoons early in his career satirized the Dora Kent debacle.



### SLIDE 117

In 1980 the grotesque scene at Chatsworth was again played out, this time, mercifully, absent any media coverage. The victims were Ann DeBlasio and a woman from Beverly Hills, California, both of whom had been placed in an inadequate facility, absent any alarms or monitoring, in Mount Holiness Cemetery in Butler, New Jersey (NJ).

That facility was a duplicate of the one Nelson had constructed in Oakwood Cemetery in Chatsworth. And yes, Nelson, along with Nick DeBlasio, had built the Butler, NJ facility as well.

## “Chatsworth East” (1980)

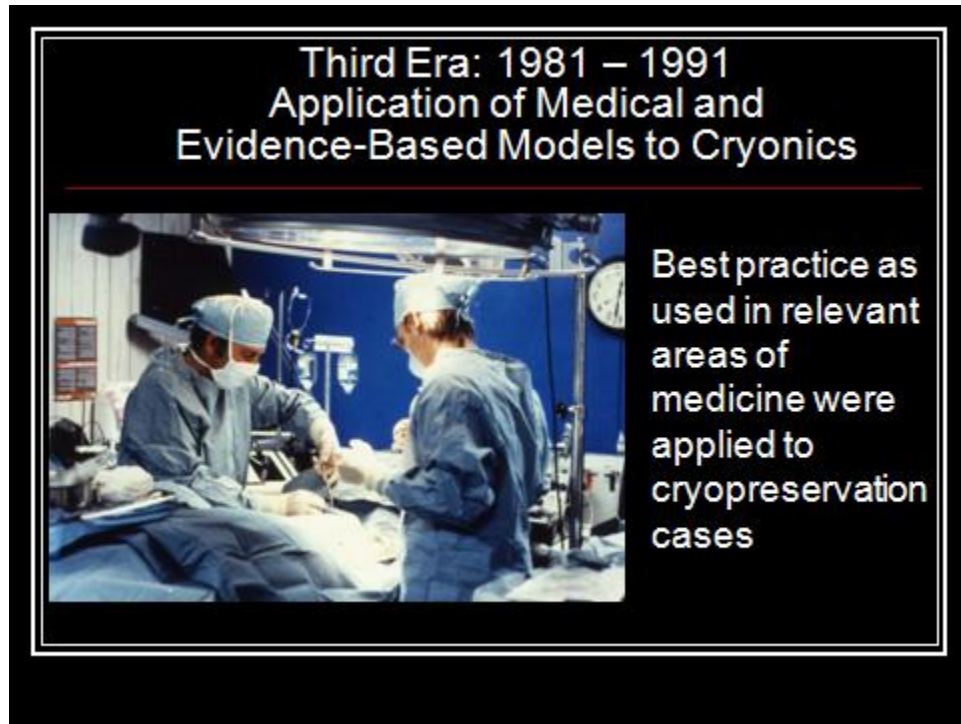


### SLIDE 118

Eleven years after she had been cryopreserved at CSNY, this is what had become of Ann DeBlasio. After the expenditure of tens of thousands of 1970 dollars and countless hours of labor any chance these two women had of returning to life was gone.

So ended the second era in cryonics.

**CRYONICS' THIRD ERA: 1981-1991**  
**EVIDENCE-BASED, MEDICALLY- MODELLED, RESEARCH-DRIVEN**



**SLIDE 119**

In January of 1980 I had the good fortune to perform two human cryopreservations back-to-back with Jerry Leaf (then associated with Trans Time) in Southern California. Jerry and I quickly realized that we shared a common vision for cryonics. We undertook to establish that the use of best practice in relevant areas of medicine be applied to cryopreservation cases and we sought to validate and master each biomedical facet of cryonics stabilization and cryoprotective perfusion and cool down procedures.

A vigorous program of *survival* animal research was undertaken resulting in validation of the above 0°C portions of the procedure.

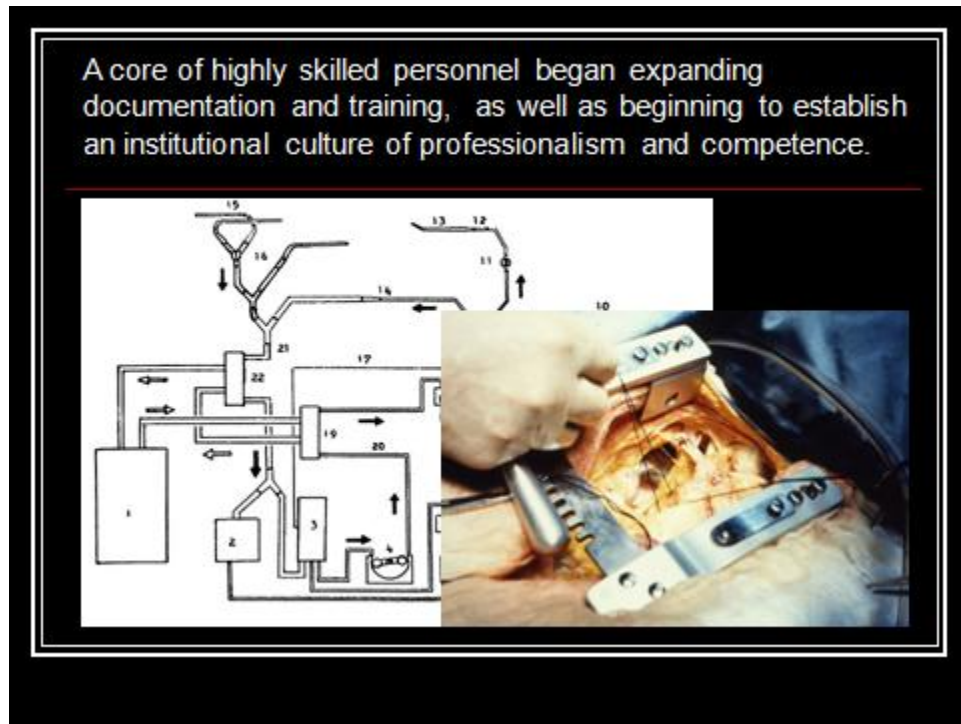


## SLIDE 120

We began a vigorous program of research to validate each step of the procedures we were applying to human patients, starting with cardiopulmonary support, blood washout and induction of ultraprofound hypothermia. We believed that by mastering these procedures and, where possible, mastering them reversibly (i.e., recovering the test animal alive and well) we would not only gain invaluable skills, but also uncover serious errors and shortcomings in our procedures – errors and shortcomings not possible to detect by armchair theorizing.

This proved to be the case in spades. It took many attempts before we could reliably recover dogs from 4-5 hours of asanguineous perfusion at 5°C. And it was to take the better part of a decade before we were able to recover

dogs following ~16 minutes of global, normothermic ischemia. In fact, Jerry did not live to see this accomplished.



## SLIDE 121

An unexpected result of this research work was that a core of highly skilled cryonics personnel was created. The complexity and long duration of the experiments forced people not only to hone their individual skills, but also to work together seamlessly as a team. Survival animal research also resulted in expanded documentation and training, as well as in the beginning of the establishment of an institutional culture of professionalism and competence.

The nature and extent of cryo-injury were more definitively characterized; fracturing injury was discovered, and the prospect of vitrification of the brain was identified.

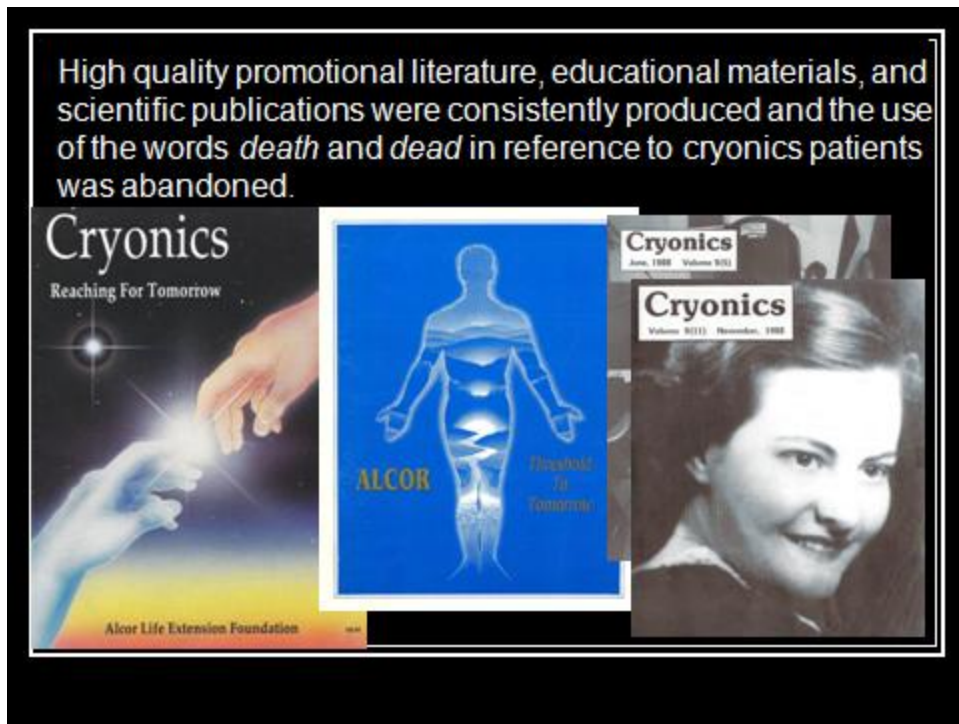


## SLIDE 122

Research was also undertaken to determine to what extent our protocols for cryoprotection and freezing were conferring protection and causing injury. This work definitively characterized the nature and extent of cryoinjury using 4 M glycerol as the CPA and uncovered the problem of fracturing in tissues and organs cooled to below the glass transition point<sup>1</sup>T<sub>g</sub> of the cryoprotective solution.

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<sup>1</sup> The glass transition point is the temperature at which a liquid becomes a glass - or in other words – become a solid by getting thicker and thicker as it is cooled without undergoing freezing. Frozen tissues impregnated with glass forming cryoprotectants such as DMSO or glycerol will be part ice and part glass. The more of the tissue in the glassy or vitrified state the more it will be crack or fracture when cooled below its glass transition point.

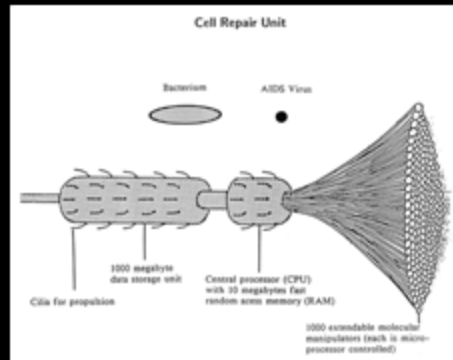


## SLIDE 123

High quality promotional literature, educational materials, and scientific publications were consistently produced and the use of the words *death* and *dead* in reference to cryonics patients was abandoned, correcting the semantic imprecision that had so handicapped cryonics since its inception.

And something else began happen that was quite remarkable. Despite the fact that Alcor was very low profile with respect to the media, we began to grow. In fact, *cryonics* began to grow again after over a decade of near total stagnation that was the legacy of the devastating hit its reputation had taken after Chatsworth.

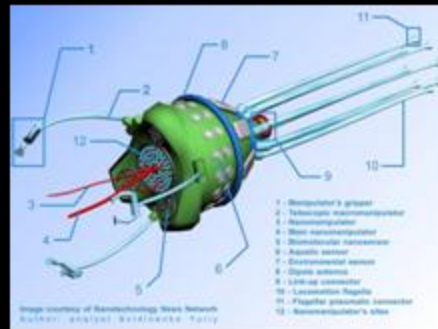
Credible scenarios for repairing and resuscitating cryopatients, including reversal of cryoinjury and rejuvenation, were created and widely disseminated to both the scientific community and the public.



## SLIDE 124

Because of our professional and scientific approach to cryonics we attracted the interest of important scientists and theorists far removed from our own discipline. In March of 1984 a manuscript was sent to my attention at Alcor entitled, *The Future by Design*. That manuscript was to become the book the The Engines of Creation and the man who sent it to me and to others at Alcor for comment and review was its author, Eric Drexler.

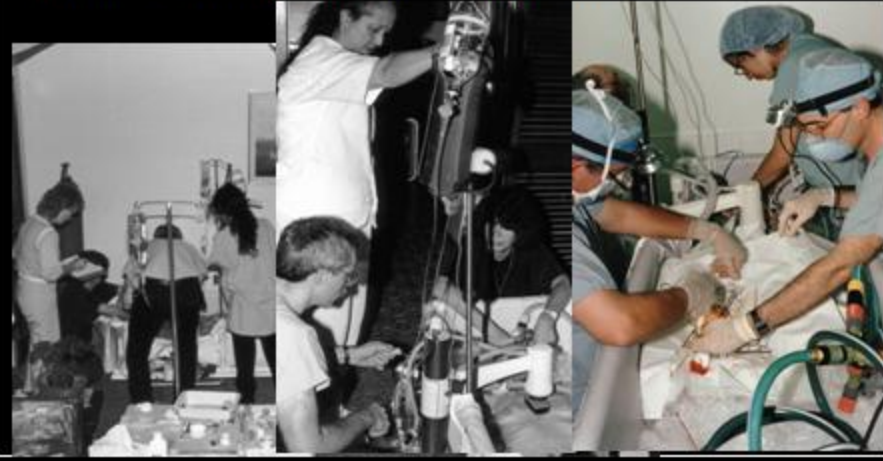
The ideas of nanotechnological repair and rejuvenation, as well as the information-theoretic criterion for death, were introduced and vigorously promoted via both in-house and media venues.



## SLIDE 125

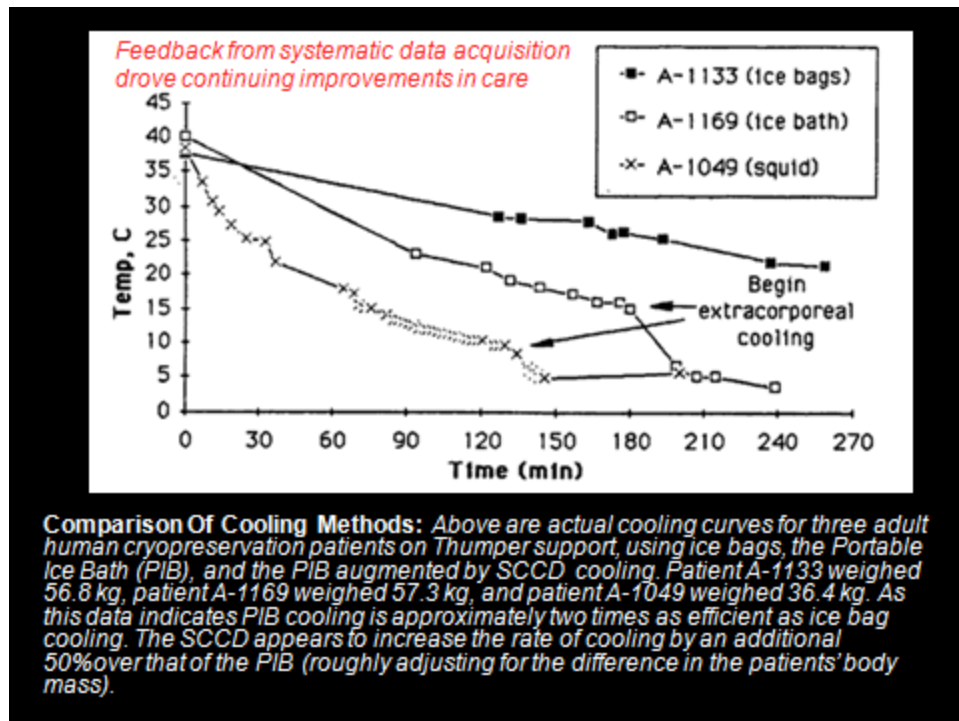
The ideas of nanotechnological repair and rejuvenation, and of the information-theoretic criterion for death, were introduced and vigorously promoted via both in-house and media venues.

*Immediate post-arrest, in-home stabilization and cooling of patients, coupled with pharmaco-protection of the brain against ischemia-reperfusion injury, followed by blood washout in a mortuary and rapid transport to CPA perfusion facilities became routine.*



## SLIDE 126

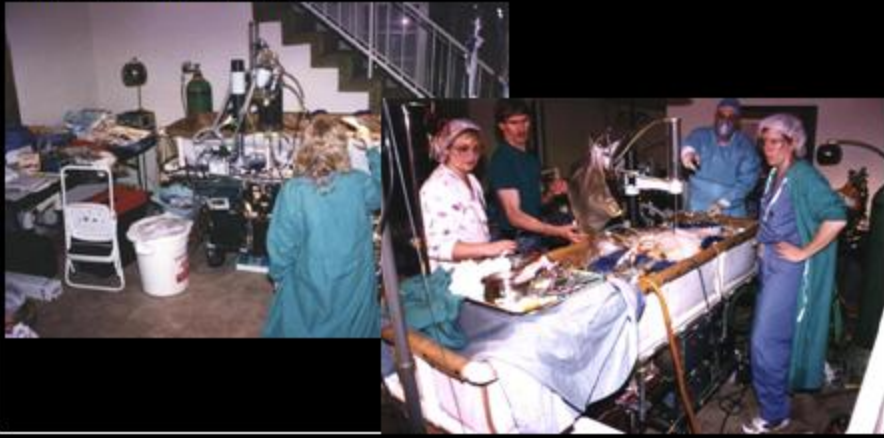
*Immediate post-arrest, in-home stabilization and cooling of patients, coupled with pharmaco-protection of the brain against ischemia-reperfusion injury, followed by blood washout in a mortuary and rapid transport to CPA perfusion facilities became routine.*



## SLIDE 127

The feedback we received from ongoing systematic and broad bandwidth data collection yielded new insights, allowing us to vastly improve the quality of care we were delivering. By the simple expedient of monitoring patients' temperature descents we were able to more than triple the rate at which patients were being externally cooled during Stabilization and Transport.

In-home extracorporeal support followed by blood washout (with external CPS as a bridge to CPB) became routine in hospice cases. Along with this technology sophisticated mechanical CPS (ACD-HI-CPR) coupled with cold fluid peritoneal lavage greatly improved cooling rate and reduced ischemic injury.



## SLIDE 128

In-home extracorporeal support followed by blood washout (with external CPS as a bridge to cardiopulmonary bypass) became routine in hospice cases. Along with this technology sophisticated mechanical CPS (active compression-decompression high impulse CPR (ACD-HI-CPR) coupled with cold fluid peritoneal lavage greatly improved the post arrest patient cooling rate and reduced ischemic injury.

## Comparison of Cooling Rates of Four Cryopatients

Patient Number	Cardiopulmonary Response Score	Age (years)	Weight (kilograms)	Height (Feet/Inches)	Surface area (square meters)	Weight status	Cooling rate (degrees C/min) first 10 minutes	Cooling rate (degrees C/min) first 30 minutes
C-2150	***	55	63	6'1"	1.85	+++	1.05	0.56
A-1260	**	39	66	6'2"	1.87	+++	N/A	0.24
ACS-9577	[zero]	55	60	5'10"	1.725	+++	0.175	0.15
A-1049	****	69	32.8	5'3"	1.21	++++	0.32	0.38

*The number of asterisks after the case number indicates the overall score (from zero to \*\*\*\*) for response to cardiopulmonary support as evaluated by EtCO<sub>2</sub>, skin color, femoral pulse, and other parameters when available. (From Cryocare Report #6, January 1999, p. 15)*

## SLIDE 129

By continuing to collect data and do research we were able to further increase patient cool rates to ~0.5°C min for the first 30 min of CPS!

The diagram on the left illustrates the closed drainage tube setup. It includes a balloon-inflated tube, a valve, an 80 cc syringe, a 17 cm intraperitoneal drainage tube, an 80 cc closed external drainage balloon, and a distal drainage tube. A note states: "Closed drainage tube designed to keep peritoneal drainage on the way of avoiding air entering a cold infusion to be administered directly to the patient's colon and/or abdominal cavity."

The graph on the right, titled "JG Suspension", plots Temperature (degrees Celsius) on the y-axis (0 to 40) against Minutes Post-Arrest on the x-axis (0 to 240). Three data series are shown:
 

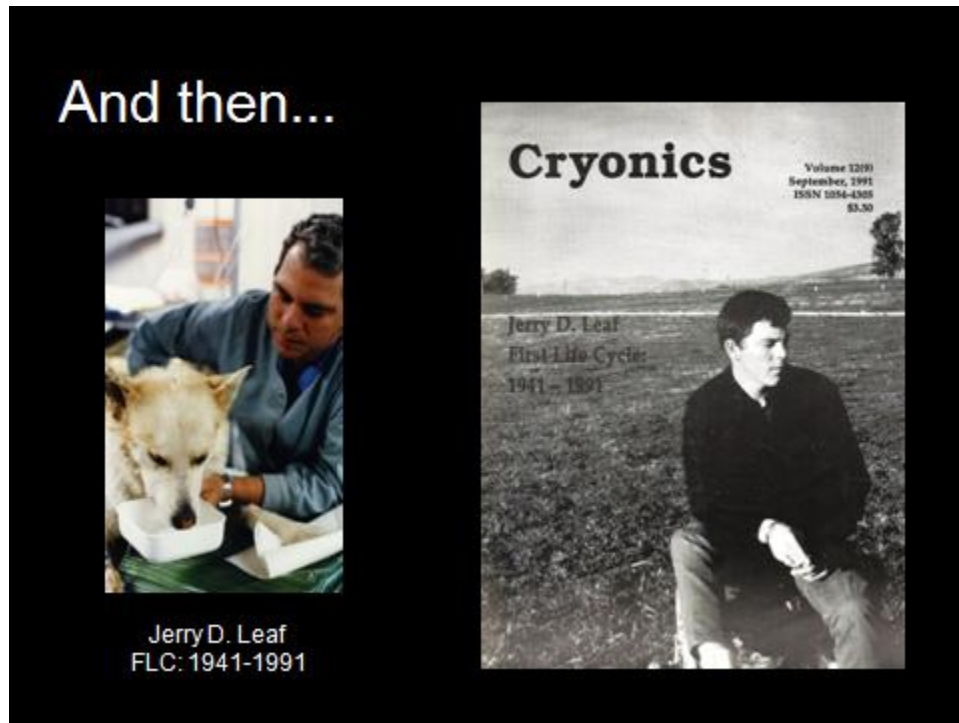
- Peritoneal lavage w/ Normasol @ 0 degrees C** (black line): Starts at ~37°C, drops to ~30°C by 15 minutes, then gradually decreases to ~5°C by 240 minutes.
- Colonic lavage w/ Normasol @ 0 degrees C** (red line): Starts at ~37°C, drops sharply to ~18°C by 15 minutes, then gradually decreases to ~2°C by 240 minutes.
- Tympanic** (black line): Starts at ~37°C, drops to ~30°C by 15 minutes, then gradually decreases to ~5°C by 240 minutes.

 A vertical dashed line at 140 minutes marks the "Start of bypass with washout". A blue arrow points to the red line at approximately 150 minutes.

SLIDE 130

We also discovered that we could detect when cerebral perfusion failed during CPS by continuously recording temperature descent data from multiple sites in the patient. The abrupt leveling-off of the tympanic cooling curve shown in this slide indicates the point where cerebral perfusion during closed chest (mechanical) CPS was lost. The blue arrow indicates the point where effective cerebral perfusion (and thus cooling) was re-established after the start of cardiopulmonary bypass.

## DISASTER STRIKES



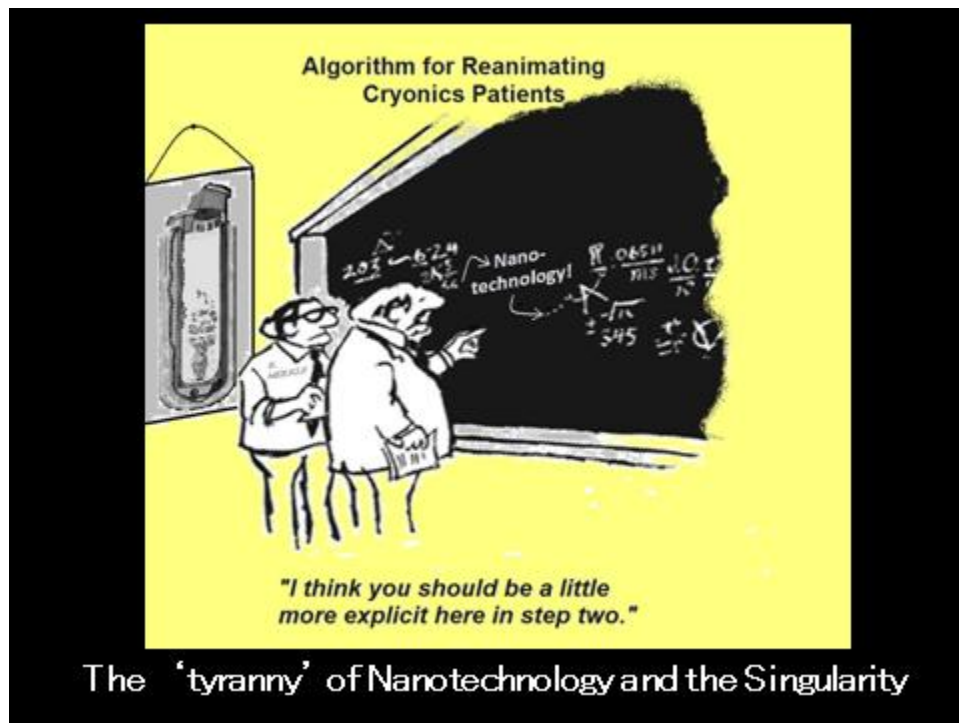
### SLIDE 131

And then, on 10 July, 1991 Jerry Leaf experienced sudden cardiac arrest and was cryopreserved. Jerry was the lynchpin that held the diverse interests and personalities together that comprised Alcor.

One unappreciated consequence of his sudden and unexpected cryopreservation was the impact the absence of his quiet authority and enormously stabilizing influence would have on the various strong personalities in Alcor, and on their diverse interests and objectives towards Alcor in particular, and on cryonics as a whole. Additionally, Jerry's control over the medical and surgical service delivery component to Alcor, via his Cryovita Laboratories,

Inc., provided a powerful balancing check on internal power politics.

Thus, Jerry's absence critically destabilized the leadership dynamics of the organization.

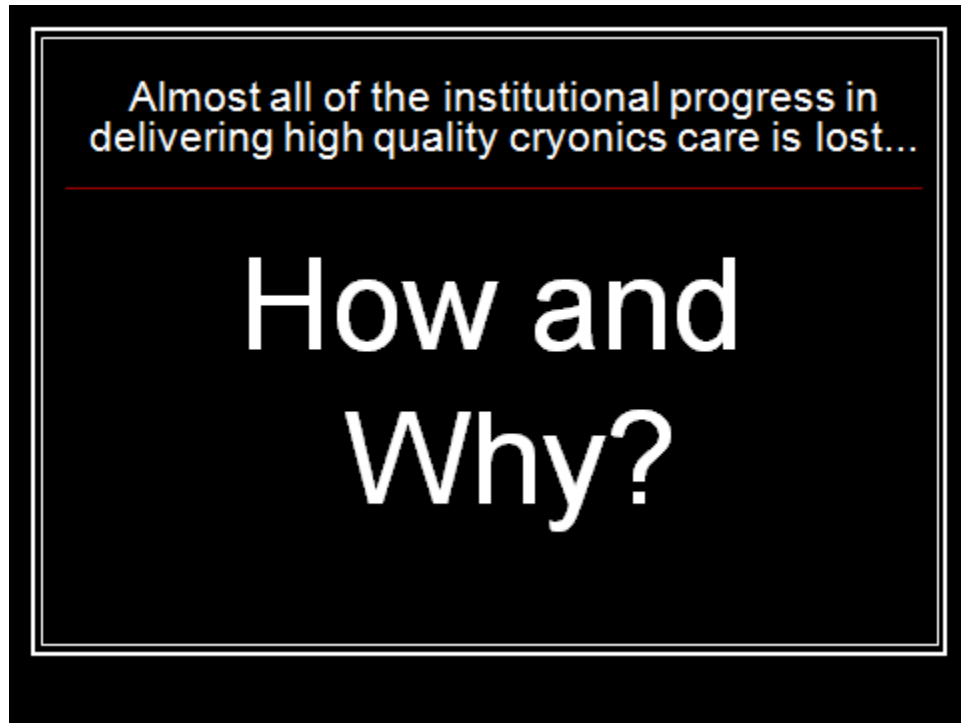


## SLIDE 132

The final blow to the third era of cryonics was the coming of the 'tyranny' of Nanotechnology (NT) and the Singularity about which I'll have more to say later in these lectures.

Criticism of deteriorating procedures and increasingly sloppy practices at Alcor were blunted by the reassuring effect that 'strong' NT and the supposed nearness of the

Singularity had on the majority of the younger and most active members of Alcor.



SLIDE 133

How and why did this happen? How did Alcor go from in-home cardiopulmonary bypass to a state where patients count themselves lucky if they even receive prompt heart-lung resuscitator (HLR) support and get packed in ice?

## Here's Why (in part)

- Small organizations are shaped by the personalities of the 2 or 3 people who found and operate them
- Creation of a viable institutional culture requires at least one generation (~21 years) of stable, uninterrupted mentoring, and a solid base of practitioners (6-12)
- Death or loss of emerging professionals destroys the developing culture of professionalism

### SLIDE 134

It happened because small organizations are shaped by the personalities of the 2 or 3 people who found and operate them and because creation of a viable institutional culture requires at least one generation (~21 years) of stable, uninterrupted mentoring, and a solid base of practitioners (6-12 people).

If death or loss of emerging professionals destroys the developing culture of professionalism, then the whole system collapses, and usually any effort to recover lost quality and competence must originate outside the failed system (and away from the hard core of the well entrenched institutional cultural paradigm that will have developed in its absence).

## There's no Harvard Medical School of Human Cryopreservation



### SLIDE 135

It is important to understand that the practice of a scientific and medical model based approach to cryonics cannot be achieved by the simple expedient of finding and recruiting medical professionals or medically qualified technical specialists such as paramedics, perfusionists, physicians or nurses to ‘do the job’ of delivering cryonics patient care. Few of you here today would presume that a General Practitioner could competently perform as a neurosurgeon – or even that a psychiatrist could pinch hit for one – even though both of latter are specialists in treating the same organ – the brain.

While the professional practice of cryonics requires a deep and interdisciplinary knowledge of medicine that is *not* enough. It requires much additional knowledge and

training which is not available at university, nor unfortunately, in *any* structured form at this time. Perhaps more importantly it requires the skill-set and mindset of a *highly motivated* researcher knowledgeable about cryonics and capable of both asking and answering the right questions. These kinds of individuals are almost always produced by an institutional culture that mentors and motivates, as well as teaches and instructs. Absent that, they are very rare in any discipline and have been especially scarce in cryonics due to its small size and its historically bad public image and scientific reputation.

Professionalism is, at its core, a result of people who care deeply about what they are doing and genuinely believe that their art and science is making a difference and is in some way deeply transformative (or even revolutionary) with respect to the world as a whole. I suppose the most direct, if not the most elegant way to put this, is that to do cryonics well you must love cryonics – love the practice of it – not just the idea of it. That alone is not sufficient, but when coupled with capability and competence, it is the minimum that is required.

## Consider summiting Everest...

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SLIDE 136

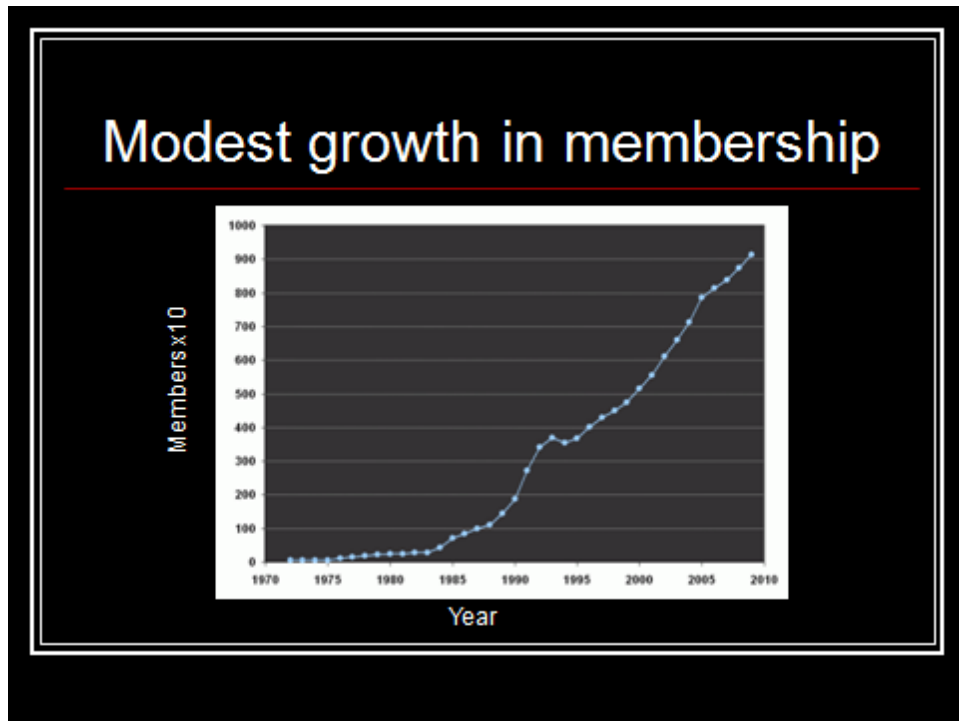
This is a very hard concept to communicate. Perhaps it can best be conveyed by analogy. The business of climbing a mountain is deceptively simple and consists of walking, climbing and crawling all of which are basic if not intrinsic human skills. However, if we consider what is required to climb a very tall peak, such as Mount Everest, we will soon realize that a great deal more is required than the basic motor skills I've just listed. The extremes of temperature and the scarcity of oxygen make it a formidable technical challenge, and what's more, a truly awesome biomedical one. All kinds of knowledge and skills both sophisticated and subtle are necessary.

But beyond the purely technical, anyone who would summit Everest must have an astonishing emotional

commitment to the task as well as incredible fortitude and strength of will. It is a horrendous effort and it is not only *not* for the faint of heart, it is not for anyone who lacks deep commitment to the task. A profession is very much like the sport of mountain climbing. Most of its practitioners will spend all of their professional lives summitting well trod and fairly mundane peaks and guiding others to do the same. A few will summit difficult peaks and in so doing add some small measure of knowledge to the craft. Only a very few will try to go where no others have gone before and do so under the most dangerous and demanding conditions. These individuals are extraordinarily rare and they invariably found or define the professions they practice.

So, while it is possible to train many people to climb mountains, and even to teach them the technical skills required to summit Everest or K2, it is not possible to give them the drive, the stamina and the passionate desire that are also required (at least at this time and with currently available technology).

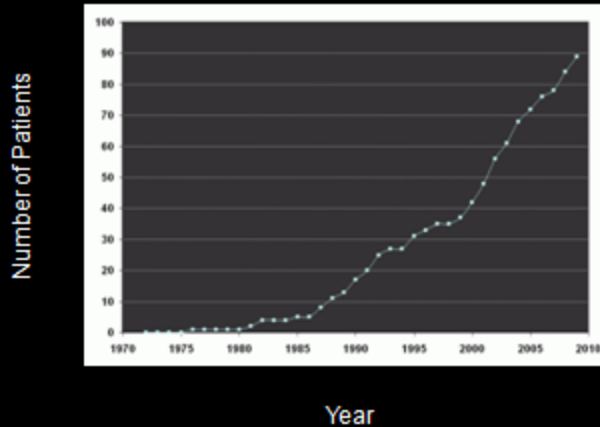
## THE CONSEQUENCES OF FAILURE



### SLIDE 137

Alcor had achieved an exponential rate of membership growth by the time Jerry Leaf was cryopreserved. Since that time, there has been only modest growth of membership and in fact, in the years since 2007, membership growth has flattened.

## ...and patient populations.



### SLIDE 138

The growth in the patient population has been similarly stunted with almost all increase being due to the cryopreservation of members, rather than at-need cases. The time when Alcor selected the highest quality at-need cases and delivered state-of-the-art care to those patients has now become a dim memory and, with one exception, the staff at Alcor has no experience with cases where immediate CPS, followed by prompt extracorporeal support, proceeded smoothly and without incident.

While it is easy to see the risks associated with at-need cases, particularly in the absence of careful vetting and strict adherence to predetermined (and protective) acceptance criteria, it is not so easy to see the even greater cost of foregoing them.

The quality of any complex procedure, medical or otherwise, is directly dependent upon the amount of experience staff have in doing it. Even highly trained and skilled personnel benefit from the experience gained by doing large numbers of cases. In fact, in medicine it has been a consistent finding that outcome in terms of morbidity and mortality in areas as diverse as open heart surgery, radiation oncology and HIV management improves steadily as a function of the number of procedures performed, or cases handled annually. The benefit of an increased case load is even more pronounced when the transition is made from a few cases per year to a few dozen per year, or more.

Absent a case load that keeps the cryopreservation team continuously busy, the only way to maintain even a semblance of competence is to carry out a program of animal research using a survival model that employs the same equipment, facilities and procedures that are employed in human cryopreservation cases. Absent this kind of day-in, day-out experience, it becomes impossible for staff to remember (or even know) where supplies are, how to calibrate, operate and troubleshoot equipment, and just as importantly, how to work together cohesively as a team.

The person leading that team and directing that research must be a competent and motivated 'mountain climber'...



## SLIDE 139

The person leading that team and directing that research must be a competent and motivated 'mountain climber' – otherwise the work will be a meaningless and gruesome exercise that achieves nothing but the demoralization of those participating in it.

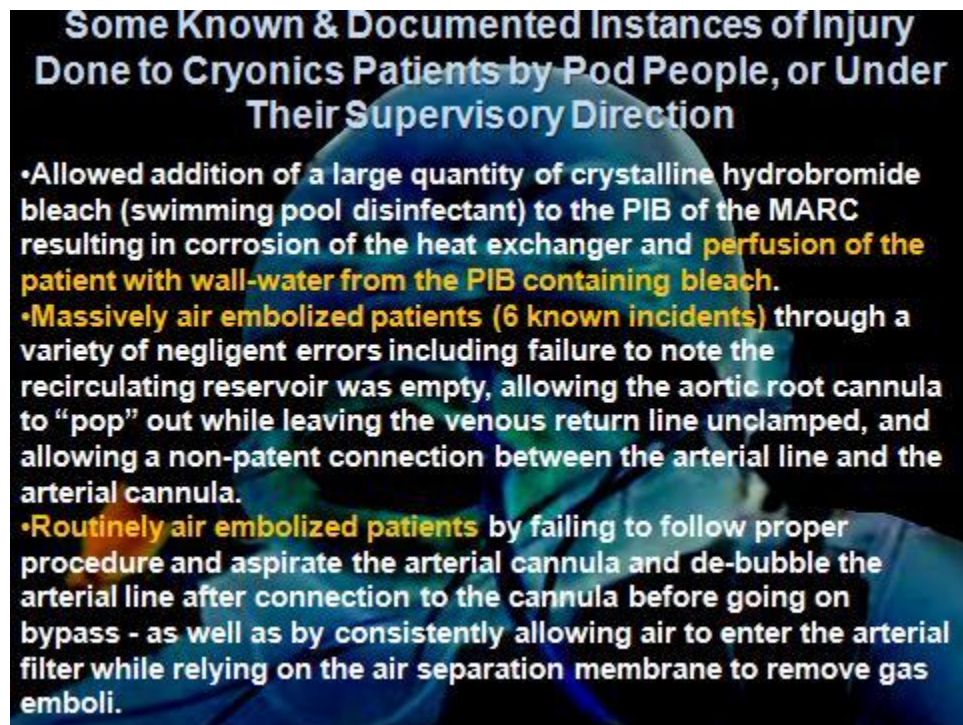
# Medical Training & Mentoring



## SLIDE 139

Medical malpractice is a pretty common thing and as we have seen iatrogenic deaths are commonplace. That this is so, given the extensive training and mentoring physicians receive, should give us pause for thought. To become a General Practitioner in the UK or the US requires 12 years of postgraduate training. That is a huge commitment in terms of both time and money and it requires substantial motivation over and above the likely financial returns (in the UK or the US). This level of training and commitment act as a human filter – effectively removing many people who are not suited to the task of being physicians either as a result of ‘defects’ in temperament or due to lack of intellect or skill.

However, this slide is misleading in that most of the real filtration has already taken place before a student enters medical school, or perhaps I should say more appropriately, is *accepted* to medical school. Roughly 95% of those who score well on the MCAT (Medical College Admission Test) or the UKCAT (UK Clinical Aptitude Test) and are subsequently admitted to medical school will finish it! Most of the separation of the wheat from the chaff takes place as a result of the MCAT/UKCAT scores and during the admissions process when the complete academic and behavioral profile of the candidate is evaluated.

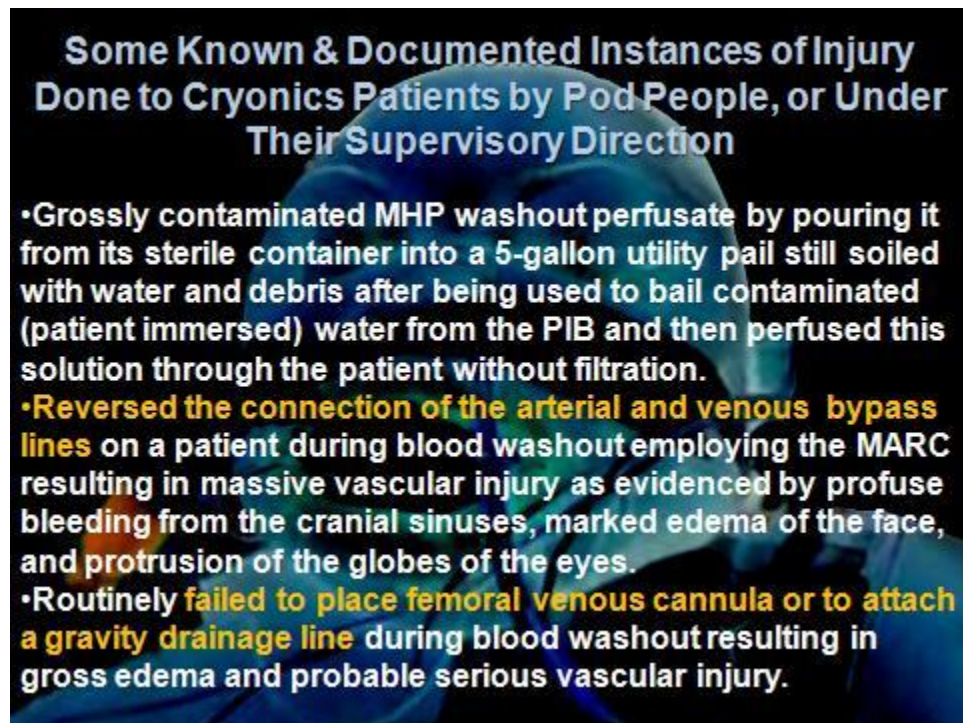


## SLIDE 140

What this means is that in practice only about 0.01% of the ~12% of graduating secondary school students who

say they want to become physicians actually do so. Yet despite this high degree of selection and the extensive and costly training that follows, iatrogenesis is still a leading cause of death in both the UK and the US!

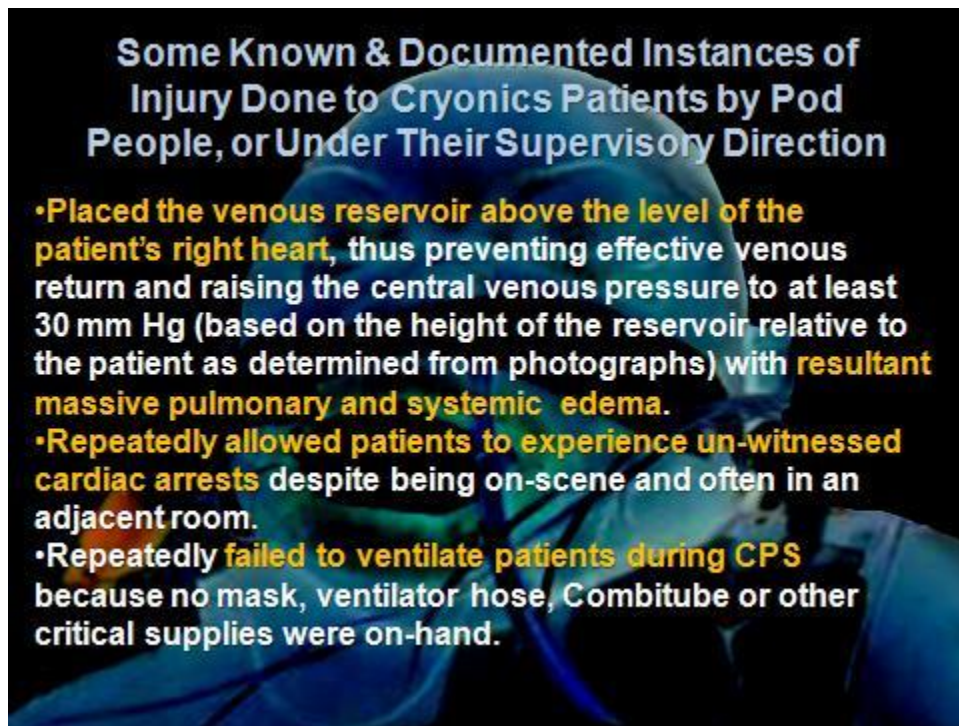
The implications of this for cryonics are pretty straightforward, although still hard to comprehend. In fact, most cryonicists simply refuse to believe what is on the previous slide and the 5 slides that follow.



## SLIDE 141

All of these errors have occurred in the period of 1991 thru the present. Some, such as reversing the arterial and venous bypass lines or pouring sterile perfusate into a feces soiled container before perfusing it through a patient defy

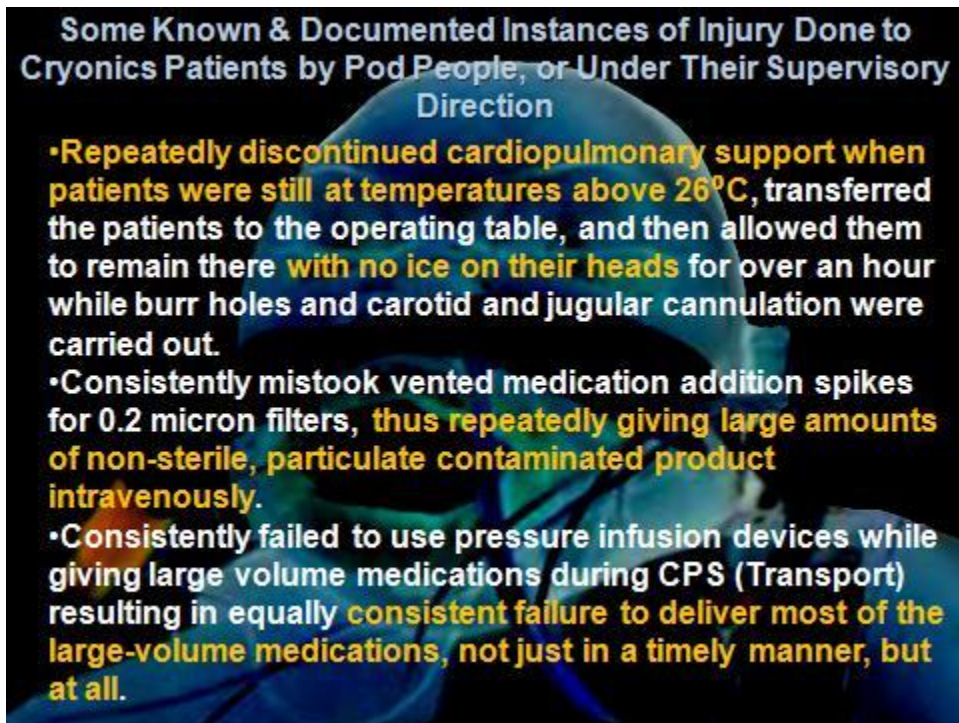
understanding even when it is accepted that they actually took place.



## SLIDE 142

As we've just seen, as is the case with iatrogenic errors in medicine, mistakes happen even when practitioners are highly trained and carefully vetted. Without exception all of the well respected and highly qualified critical care physicians and surgeons whom I've known well have told me that in the course of their careers they made errors that cost patients their lives or resulted in serious and lasting morbidity. Indeed, I've made mistakes in caring for patients – the most serious of which involved errors in judgment that resulted in extra minutes of exposure to warm ischemia. In hindsight, both of these errors were easily avoidable by the simple expedient of

insisting that reliable, trained cryonics organization personnel stay with the patient *continuously* after the start of Standby – regardless of how uncomfortable or problematic that might be for the family so long as our ability to provide Standby for the patient was not compromised.



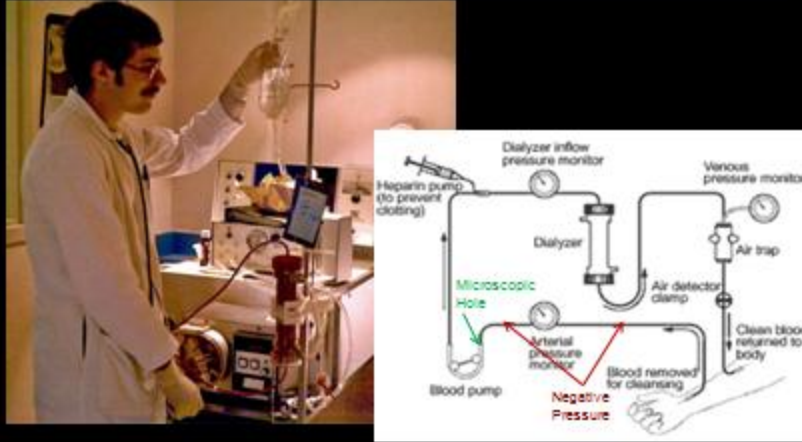
### SLIDE 143

The issue here is not that errors were made, but rather the underlying reasons, the frequency and the repetitiveness of the errors. Because of the enormous surface tension of water any air bubbles present in blood that are larger in diameter than the capillaries act as obstructions, or emboli. Thus, any air introduced into the arterial circulation of a patient receiving extracorporeal treatment will result in

blockage or embolization of the arteries supplying the tissues with blood. Depending upon the amount of air and the area it embolizes, 'pumping air' will result in either serious injury or death.

There is an old saying amongst perfusionists: "There are two types of perfusionists: those who have pumped air (into a patient's circulatory system), and those who will." Particularly in the days before microbubble detectors with automatic interrupts to shut down flow and clamp the line supplying blood to the patient were developed and put into universal use, it was typically only a matter of time until any given perfusionist made a mistake that resulted in air being perfused into a patient. This might happen once in the course of a 20 year career during which time thousands of patients would have been perfused for an aggregate of tens of thousands of clinical hours.

## Some personal perspective...



### SLIDE 144

It should also be understood that this aphorism includes incidents where introduction of air into the patient's circulatory system was arguably unavoidable. Here I'd like to speak from personal experience. For about 8 years I was a hemodialysis technician both in the outpatient and acute care (ITU) setting. During that time I 'pumped air' once. In this photo you see me doing hemodialysis in 1978 in Indianapolis, IN.

Microbubble detection equipment was available at that time, but not used at the institution where I worked. If you look at the schematic of the extracorporeal circuit used in dialysis you'll note that the leg of tubing connecting the patient's arm (artery) to the pump will be under negative pressure with respect to the atmosphere. In order for ~250

ml/min of blood to be withdrawn from the small caliber radial artery it is necessary to ‘suck’ on the vessel. A consequence of this is that if there are any holes – even ones too tiny to see – in the tubing between the artery and the pump raceway air will enter. The dialyzer is inverted to serve as a bubble trap and there is yet another bubble trap before the blood is returned to the patient.

However, in the event the breach in the tubing is very small the resulting bubbles are microscopic and remain suspended in the blood even as it passes through the dialyzer and the bubble trap. Fortunately, in dialysis, we are returning blood to the venous circulation as opposed to the arterial circulation and that means that we have another safety feature – an air bubble filter in the form of the lungs. In the case I’m discussing here there was a manufacturing defect in the arterial tubing set such that where the blood conducting tubing from the patient was joined to the pump raceway there was an incomplete seal. While the defect was invisible to the eye it was of sufficient size to allow the creation of a steady stream of microbubbles.

Approximately an hour into the treatment my patient began to complain of back pain and shortly thereafter shortness of breath (SOB). I rechecked the composition of the dialysate (blood washing solution) and checked the integrity of the circuit and found nothing amiss. However, as the back pain and SOB increased in severity I became extremely concerned. I realized that these were symptoms of micro-air embolism and I got a flashlight and carefully examined the tubing carrying blood back to the patient.

There was a barely visible fine whitish line at the top of some of the tubing. This was an accumulation of microbubbles that had risen to the top of the blood flowing through the tubing. The patient was immediately removed from the machine and recovered uneventfully and with no lasting harm.

Interestingly, it took the deaths of two patients from air embolism at that institution before ultrasonic air bubble detectors were purchased and added to the dialysis machines.

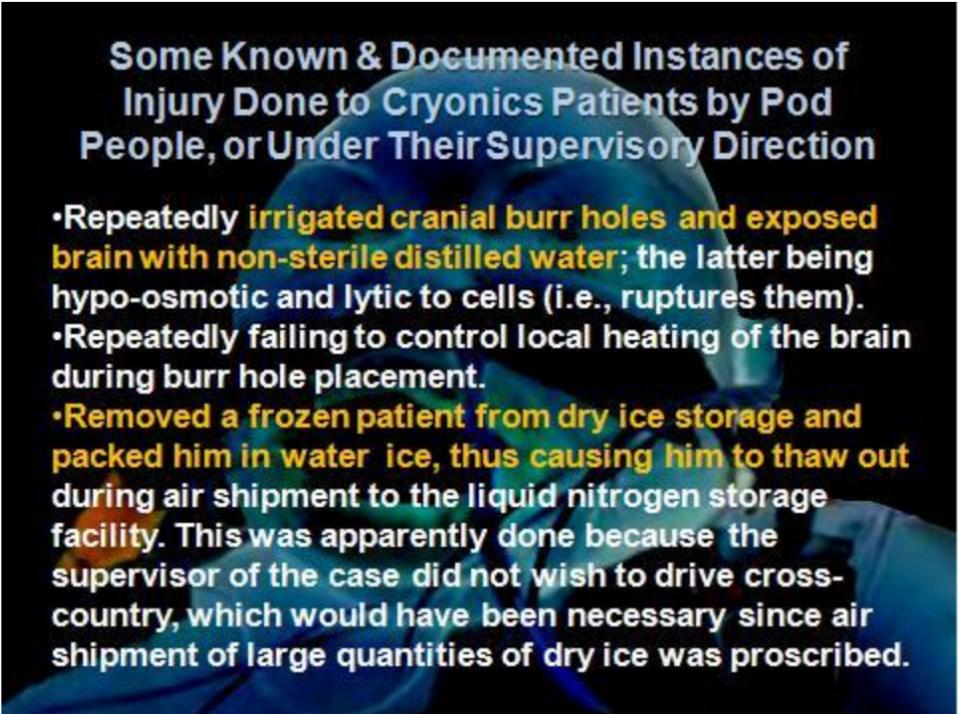


## SLIDE 145

At left is the Travenol RSP dialysis machine that I began my career with and at right is a contemporary, highly automated hemodialysis machine. There are bubble traps

on *both* the arterial and venous legs of the circuit and, of course, sophisticated ultrasonic microbubble detectors which will shut down the pumps and clamp the lines in the event air in the blood is detected. Additionally, these machines mix the dialysate in real time and ensure it is safe, calculate and implement water removal from the patient and otherwise carry out a myriad of tasks we never dreamed would be possible to ‘automate’ in 1978.

Most of these advances came at the price of injury or death to patients who were treated with earlier generations of less sophisticated equipment. In 1978 universal chronic hemodialysis was only 6 years old in the US and I worked in one of the pioneering units making the treatment available to hundreds of patients who previously would have died. While some of the errors and shortcomings of that program were avoidable – many were not – they came as part of the price tag for implementing a then new and demanding technology on a scale previously undreamed of.



**Some Known & Documented Instances of  
Injury Done to Cryonics Patients by Pod  
People, or Under Their Supervisory Direction**

- Repeatedly irrigated cranial burr holes and exposed brain with non-sterile distilled water; the latter being hypo-osmotic and lytic to cells (i.e., ruptures them).
- Repeatedly failing to control local heating of the brain during burr hole placement.
- Removed a frozen patient from dry ice storage and packed him in water ice, thus causing him to thaw out during air shipment to the liquid nitrogen storage facility. This was apparently done because the supervisor of the case did not wish to drive cross-country, which would have been necessary since air shipment of large quantities of dry ice was proscribed.

**SLIDE 146**

I understand errors and I understand their increased frequency and probable severity when implementing any complicated new technology. However, that is not the kind of failure I'm talking about here in cryonics. The errors listed in these slides are not occasional but rather have become routine. Many are so base that they rise to the level of uncaring negligence.

Consider, for example, the case where a patient frozen to dry ice temperature was removed from dry ice storage and packed in water ice for air shipment to the cryonics facility because of airline restrictions on the amount of dry ice that could be used to refrigerate the patient in transit. Obviously, the patient thawed out before arriving at the cryonics facility and had to be refrozen. That means that

tissue ultrastructure that was compressed and fragmented by initial straight freezing (but ostensibly locked in place by ice) would be returned to an aqueous and diffusible state – indeed a state characterized by intense fluid turbulence and ‘stirring’ as concentrated pools of electrolyte diffused and re-equilibrated with the large masses of nearly pure water created by melting ice crystals!

When ‘average’ cryonicists with no technical background or training are told that an ‘experienced’ cryopreservation team leader took a patient out of dry ice and packed him in water ice they are uniformly appalled. Most cannot even understand how or why such a decision would be made by anyone, let alone a highly experienced cryonics caregiver. The same is true of many of the other errors just discussed.

But what is perhaps most shocking and seemingly inexplicable is the complete absence of any visible emotional reaction to these errors. When I discovered microbubbles in the venous return line of the patient I was dialyzing I had an immediate and strong reaction of fear and anxiety bordering on terror. Was the patient going to be all right? Had any permanent harm been done? Next came a wave of dread and worry that I had not delivered good care. Was there something I could have or should have done to prevent the injury to the patient? Could I have detected the problem sooner and acted to prevent some of the pain the patient experienced? With years of experience in medicine I’ve come to understand that this kind of emotional response is both normal and healthy. Strong feelings of

discomfort in such situations are an essential part of not repeating the error. This empathetic and self critical emotional response to iatrogenic events seems to be completely absent in an increasing number of cryonics caregivers.

## THE POD PEOPLE

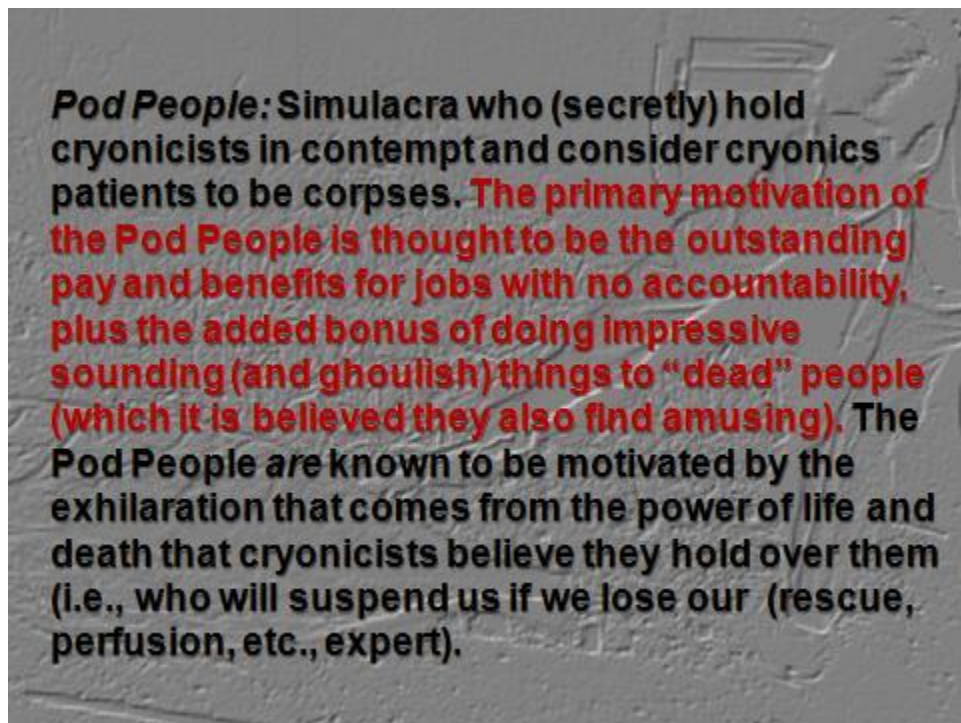


### SLIDE 147

As it turns out, I was not alone in having noticed this phenomenon. Aschwin de Wolf, then employed at Suspended Animation, Inc. in South Florida, was observing the same kind of behavior in a range of settings within the cryonics community. We both found it puzzling to the point of incomprehensibility that people who were delivering care to cryonics patients, in some cases medically trained professionals, could be so indifferent to errors that would, in a conventional medical setting, be career ending or at very least result in costly and traumatic litigation.

This phenomenon was most pronounced in non-cryonicist medical and technical professionals who had

been hired to deliver care to cryonics patients. Superficially these individuals seemed to be competent and caring, but a closer examination revealed this to be anything but the case. This was especially surprising to me because I had hired and worked with non-cryonicist medical professionals in the past and had never encountered behavior even remotely like that which Aschwin first identified. In my correspondence with Aschwin I likened such individuals to the ‘Pod People’ in the novel and films *Invasion of the Body Snatchers*.



## SLIDE 148

While we speculated as to the possible motivation such people might have in becoming and remaining involved in delivering cryonics services (financial gain

aside) we did not have to speculate as to what constituted a 'Pod Person' in cryonics.

<b>Characteristics of Pod People</b>	
<b>Pod People:</b>	<b>Cryonicists:</b>
<ul style="list-style-type: none"><li>■ Never discuss their deep personal fear &amp; loathing of death (they don't have any)</li><li>■ Slip-up and will use the words "they" or "them" when discussing patient choices, procedures used, or intimate (choice) issues regarding members</li><li>■ Show no outrage, disgust, fear or anger at iatrogenic errors that injure cryopatients</li><li>■ Have no interest in and do not discuss in detail, or in a prolonged way, existential risks and problems in cryonics or in life in general</li></ul>	<ul style="list-style-type: none"><li>■ Are acutely aware of, and are often preoccupied with their own mortality; discuss the horror of it; express concern about brain-destroying illnesses as a threat to their own cryopreservation.</li><li>■ Use the words "us" when discussing members and never use the words "they" or "them" when discussing patient choices</li><li>■ Are disbelieving, angry or frustrated when the issue of iatrogenic events is brought to their attention (or discussed if they already aware of the problem)</li></ul>

## SLIDE 149

I want to credit Aschwin with first articulating most of these characteristics. He put into words things which I had observed myself, but had not fully understood and he identified a number of traits which I had not (at that time) observed myself. Since he was a cryonicist and he was in intimate contact with a culture of non-cryonicist 'employee professionals' he was uniquely situated to observe and understand what was going on.

## Characteristics of Pod People

### **Pod People:**

- Rapidly become bored and wander off during discussions of cryonics technology, current events or history
- Engage in no serious personal interventions to extend their lives and show little interest in same (i.e., supplements, CR, LE drugs)
- Do not engage in charitable giving to, or membership in, related organizations such as LEF, Venturists, IS, CRS, etc., and do not subscribe to LE, TH, NT or related publications outside of their cryonics-related work needs

### **Cryonicists:**

- Typically show interest in the history of cryonics and in the history of related areas such as experimental gerontology and life extension.
- Invariably are taking steps to extend their healthy years (square the curve) and very frequently taking more aggressive measure to attempt to slow the morbidity of aging and to attempt to extend their lifespan.
- Use several supplement or LE drugs
- Invariably are members of some other organizations involved in LE, Transhumanism, or at least subscribe to on-line use groups or publications which deal with these disciplines

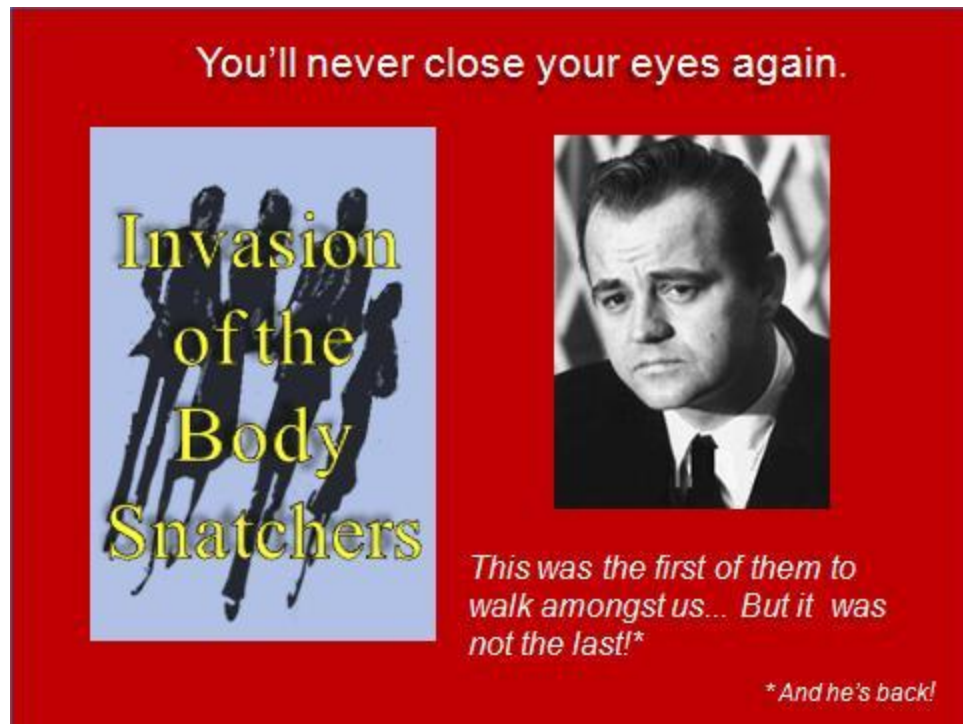
## SLIDE 150

What he discovered was that people who are not cryonicists, and who are not selected and mentored to hold the values of people who are, behaved with uncaring indifference towards their patients. Not infrequently they actually held cryonicists in contempt considering them 'chumps' or 'fools' who are tilting at windmills while being consumed with an unnatural and cowardly fear of death.

It seems likely that these people are, in effect, recruited from and filtered out of the larger population of caring and empathetic health care providers and professionals. Absent a cohesive program of instruction and mentoring coupled with meaningful and results-driven day to day activity it would be difficult for anyone, cryonicist

or not, to remain engaged and committed to such a job. More to the point, few if any truly competent and caring persons (professional or otherwise) would accept and remain in a job where there was no 'real' day-to-day work, no leadership, and no sense of mission or accomplishment. The kind of people who stay in such a position – especially given their active contempt for their employers and patients – are not psychologically healthy and are certainly lacking not only in compassion, but in work ethic.

Such 'sterile' cryonics service operations led by people who lack vision, passion and commitment to cryonics themselves become highly efficient recruitment facilities for individuals who are, at best, borderline sociopaths.



## SLIDE 151

In considering the history of cryonics it became all too apparent that the existence of Pod People was by no means a new phenomenon. As many people in cryonics over the years have observed, cryonics is a magnet for frauds and charlatans. Important extensions to that observation are that the majority of these individuals are also sociopaths and that they are routinely placed in positions of power by cryonicists and cryonics organizations.

This was true in 1966 when Robert Nelson arrived on scene and it has remained the case over the course of the subsequent four decades. The Olga Visser episode is only the most public of many, many other situations where deeply disturbed or frankly sociopathic individuals have

been placed in positions of power and authority in cryonics, often within weeks or months of arriving on the scene!

Charles Platt chronicled the Visser saga very well:

<http://www.cryocare.org/index.cgi?subdir=ccrpt10&url=visser.html>, and I excerpt it only briefly here:

*“On October 9th, 1995, readers of the sci.cryonics Usenet news group found themselves confronted with a strange report quoted from the South African Sunday Times. Supposedly, a 37-year-old cardiovascular perfusionist named Olga Visser had developed a new cryoprotectant that would enable human hearts to be frozen with virtually no damage, opening up exciting possibilities in the field of transplants, where organs usually have to be utilized within several hours after removal.*

*According to the Times Ms. Visser had started her cryoprotectant research two years previously when she helped to establish a heart-valve organ bank. Since valves can be cryopreserved using DMSO, she saw no reason why she shouldn't be able to freeze whole hearts as well. Undeterred by her lack of knowledge of cryobiology, she consulted some experts, read some journals, and formulated her own cryoprotectant.*

*When she applied it to a pig heart, she reported "no damage" after the heart was rewarmed from liquid nitrogen. She described similar success with human heart tissue. Finally, "a rat heart was frozen, unfrozen, and then warmed by a special process--and started beating.*

*On September 8th an astonishing press release was issued jointly by Robert Ettinger, president of The Cryonics Institute (CI), and Steve Bridge, president of Alcor Foundation. Apparently Ettinger had been in discreet contact with Ms. Visser earlier in the year, had satisfied himself that her work was genuine, and then contacted Alcor.*

*The two groups formed an unprecedented secret alliance, contributing money to Ms. Visser's research and ultimately flying her to Alcor's facility in Scottsdale, Arizona. From August 30th through September 4th she demonstrated her experiment to Ettinger, Bridge, and several officers and directors of Alcor. She also gave CI and Alcor an exclusive license to use her present and future technology for cryonics applications.”*



Ultimately, Visser was shown to be at best a misguided incompetent, and at worst a calculating con artist. When her ‘novel cryoprotectant’ was put to an objective test at Alcor’s facilities in February of 1997, it failed utterly to protect rat hearts against freezing. The net financial hit cryonics, including licensing fees paid to Visser, air fare, equipment purchases, and contributions to support her research was estimated by Alcor’s then President Steve Bridge to be ~ \$50K. Charles Platt sums it up aptly:

*“Olga Visser's brief passage through cryonics could still turn out to be a positive, salutary event if it reminds us to be more circumspect in the future. The next time a character out of a Heinlein novel turns up with a secret formula to fix our deepest fears, we may be a little less willing to pay cash for the recipe. We may even be a little more tolerant of the smart-asses who insist on reminding us that death is not an easy adversary, human biology is infernally delicate and difficult to preserve, and scientific rigor is a fundamental necessity, not a tiresome detail.”*



## SLIDE 152

Why this happens is not much of a mystery when it is examined in the context of other disciplines that command power over and control of peoples' lives. Medicine is not more overrun with psychopathic quacks than it is only because there is a *profession of medicine*, and there are also vast bodies of regulation and law with serious penalties attached, that govern its practice. Cryonics lacks all of these safeguards. Imagine, if you will, what the situation would be if such psychopaths were empowered to fly airplanes, captain ships, or design large, heavy structures such as multi-story buildings, bridges and dams? Indeed, when such people do succeed in occupying these positions disaster is the inevitable result.

Absent these controls, both internal and external, cryonics will continue to fall prey to quacks, frauds and most dangerously, sociopaths seeking positions of perceived psychological power and control with the bonus of being increasingly well paid for indefensibly careless and sloppy work.

## Curtis Henderson

First Life Cycle: September 28, 1926 - June 25, 2009



- Inadequate CPS
- Failure to decompress ascitic abdomen prior to fem-fem CPB
- Gross mishandling of CPA perfusion resulting in near straight freezing

### SLIDE 153

Remember my example of repetitive iatrogenesis associated with ascites? Just a few weeks after I gave the first version of this lecture in 2008 it happened yet again, this time to cryonics pioneer (and my personal mentor), Curtis Henderson. See :

<http://www.suspendedinc.com/cases/Stabilization%20and%20Transport%20Case%20Report%20CI95.pdf>

and:

<http://cryonics.org/reports/CI95.html>.

I am a deeply committed and seasoned veteran of cryonics and I am telling you, without hesitation, that what happened to Curtis had a devastating impact on me. Anyone with medical sophistication who reads those two case reports will most likely just walk away and dismiss cryonics as perhaps an interesting idea with some potential – but clearly not one whose time has come.

## THE DUNNING-KRUGER EFFECT

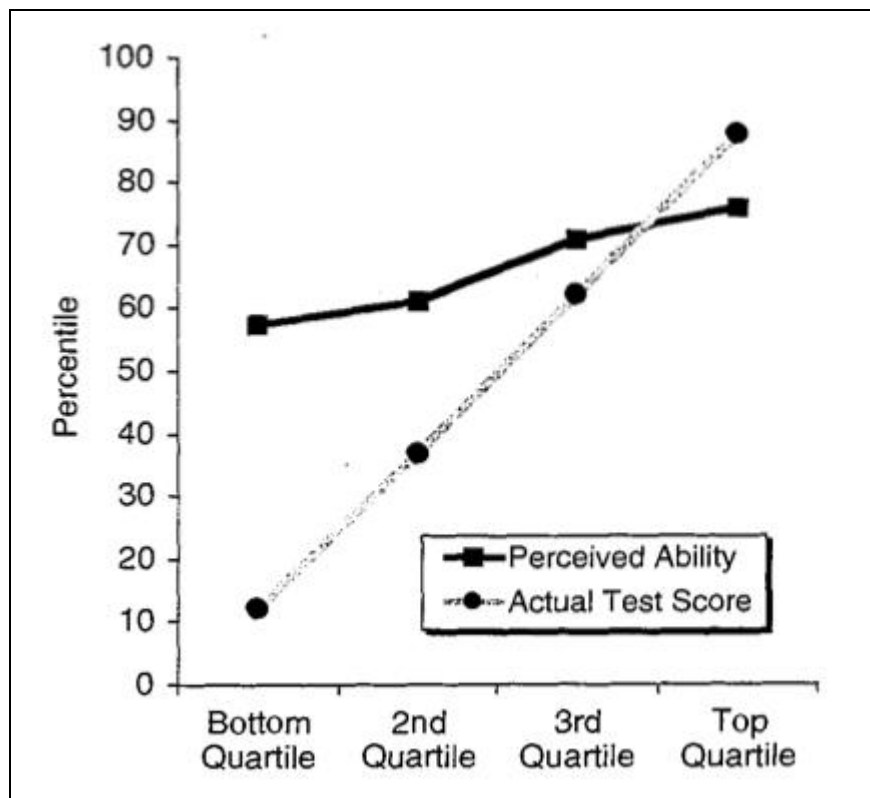


### SLIDE 154

Finally, how do we explain the actions of people in cryonics who are sincere and committed cryonicists and yet who take on technical tasks that are beyond their knowledge and skill sets with terrible results? Much of what happened to Curtis Henderson, particularly with respect to the errors made which prevented him receiving effective cryoprotective perfusion, fall into this category.

I believe the explanation lies in something called the Dunning–Kruger Effect (DKE) The DKE was put forward in 1999 by Justin Kruger and David Dunning and it posits that unskilled people make poor decisions and reach

erroneous conclusions, but their incompetence denies them the metacognitive ability to realize their mistakes. Thus, the unskilled suffer from an illusion of superiority, rating their own abilities as above average and much higher than they actually are. This leads to the situation in which less competent people rate their own abilities higher than more competent people.



### SLIDE 155

It also explains why actual competence may weaken self-confidence. Competent people often falsely assume that others have an equivalent understanding and degree of skill or competence. A very simple and pithy way to sum up the DKE was put to me by a Russian cryonicist in an

elevator at Birkbeck College: “We are so ignorant that we do not even know what we need to know, or what we don’t know that we don’t know – and that is a very dangerous situation indeed.”



## SLIDE 156

The moment at which I first truly understood the role of the DKE in causing technical mayhem in cryonics was actually documented by a journalist doing a story on the Cryonics UK (CUK) group at one of their meetings, held in Brighton, in the fall of 2009. I had met the new leader of the group the year before, and was more than a little surprised to hear him dismiss the Alcor ATP in-field cardiopulmonary bypass system as being “simple to operate and something any mortician would be capable of

immediately mastering.” When I incredulously asked if this young man had ever actually seen the ATP, he replied that he had and that it was “just a box with tubes going in and out of it.” I wasn’t the only one who was surprised at this assessment: there was a professional perfusionist in the room from a prestigious UK hospital, and he also (to put it mildly) took considerable issue with this assertion.

## The Dad's Army of British cryonics

In sleepy Sussex is a group of dedicated cryonicists who believe they hold the secret to eternal life. Simon Hattenstone joins them for a demonstration – but first they need to make sure the hosepipe isn't too leaky



**Simon Hattenstone**

The Guardian, Saturday 7 November 2009

[Article history](#)



## SLIDE 156

A year later I was having much the same discussion with what constituted virtually all of the technical people in the CUK group. After much heated and futile discussion, I proposed that rather than argue about it, they simply get the equipment and simulate putting a patient on bypass starting from the time pronouncement had occurred. At this point, I think it best to let the newspaper account pick up the narrative:

*"Tim put any doubts to the back of his mind. He's raring to go. "There's a patient on the table dying. Hurry up, Darwin says."*

*But, of course, the patient is imaginary. Tim takes the lead, explaining the ins and outs of the tubing to his less experienced fellow travellers. Meanwhile Mike Darwin watches, arms crossed reprovably, his concern for the patient growing by the second.*

*"Right, I started timing you three minutes ago," he says.*

*A good few minutes later Tim and his not-so-crack team are still working out where the red and blue bits plug into. "The only thing that goes wrong is if you switch it on without all the bits plugged in. It doesn't like it and it has been known to go bang," he says cheerily.*

*Darwin can't contain himself. "If I had that kit here, I'd be scared shitless. Shitless. There are some critical things wrong with the setup of that circuit." He tells the team they have made so many mistakes the patient would have suffered irreversible brain damage by now. Darwin suggests technology has regressed since he was in his cryonic prime 20 years ago.*

*But the water is pumping through the system, and Sinclair's team are fully focused on saving their imaginary patient. Whatever Darwin tells them, they believe they are ahead of their time, not behind it."*

I will add one thing that the reporter didn't because he had left the room to photograph some of the other CUK members before he lost his light to the setting sun. And that is that the venous blood reservoir bag in the circuit of the ATP exploded due to a misplaced clamp. The reporter apparently missed the timid request made to the meeting's hostess, Sylvia Sinclair, for a mop and towels to clean up the water that was all over the kitchen.

While it is true that cryonicists often have no choice but to undertake to provide and deliver care for themselves, it is equally true that they should not attempt to do so in ways that make the situation worse for the patient than had they taken a simpler approach that was, in fact, within their ability to master.

I had spent most of that day at the meeting trying to convince the CUK group that rather than the ATP, what

they really needed was to use a simple, inherently ‘safe’ open circuit system open circuit system equipped with a microbubble detector and auto-line clamp, to start cryoprotective perfusion as soon as was logistically feasible and to follow that with cooling of the patient to dry ice.

My lack of success in persuading obviously sincere and concerned cryonicists to undertake a course of action that was at once simpler, easier, much less costly, and vastly more likely to benefit the patient speaks to the power of the DKE and to the over-optimism and lack of realism that is endemic to cryonicists, the same over-optimism and lack of realism that makes them easy prey for con men and sociopaths.

**END PART II**