

**FM 2030
FUTURIST**

First Edition January 1, 2011 Copyright 2010 by Flora Schnall
All Rights Reserved

Published in the United States by:

The Amagansett Press Drawer 1070
Amagansett, New York 11930
theamagansettpress@yahoo.com

ISBN 978-0-943-95908-5

Library of Congress Cataloging-in-Publication Number 2010910473

By the same author

NOVELS

THE DAY OF SACRIFICE

THE BEGGAR

IDENTITY CARD

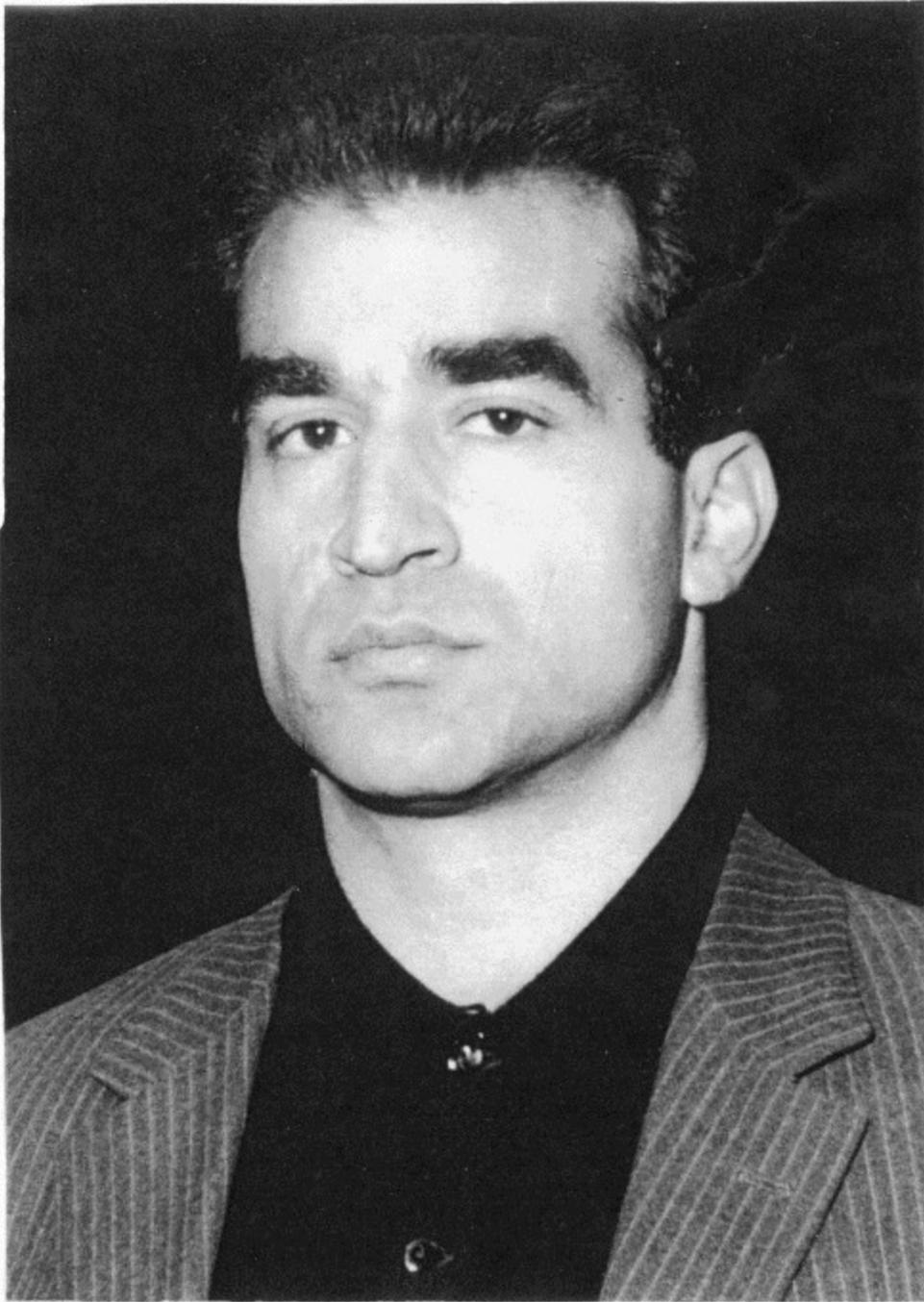
BOOKS ABOUT THE FUTURE

OPTIMISM ONE

UP-WINGERS

TELESPHERES

ARE YOU A TRANSHUMAN?



**FM 2030
FUTURIST**

the Author

About

I AM A 21ST CENTURY PERSON WHO WAS ACCIDENTALLY LAUNCHED IN THE 20TH. I HAVE A DEEP NOSTALGIA FOR THE FUTURE. FM-2030

When I first met FM in 1966, he had a conventional name. He changed his name to FM-2030 to reflect his beliefs and his confidence in the future. {STS} “Conventional names define a person {PUB}’s past: ancestry, ethnicity, nationality, religion. Long ago I outgrew such territorialities. I am not who I was ten years ago, and certainly not who I will be in twenty years. {CCH}” He believed that by the year 2030 humans could opt to be ageless with the chance to live forever. The year 2030 may be too optimistic, but I see the goal as attainable. Reading this book might bring you to share my certitude.

Son of a high-ranking diplomat, FM lived in twelve countries in the first eleven years of his life. This influenced him profoundly, causing him to think of himself as a global citizen, a goal he believed we should all share. A noted author and teacher, he was also a consultant to business, industry, and government. His books include several pioneering volumes on the Future: *Optimism One*, *Up-Wingers*, *Telespheres*, and *Are You a Transhuman?* His novels include *Day of Sacrifice*, chosen by the United States State Department as required reading for their employees, *The Beggar and Identity Card*. The latter was reviewed in *The New York Times* by Ann Tyler during the time of the Iranian Revolution. Ms. Tyler wrote: {STS} {NEL} “...it is the perfect way to find out why so many fists are raised in Iran today. {CCH}”

FM-2030 played basketball in the 1948 Olympics for Iran, attended the University of California in Los Angeles, taught at the New School for Social Research in New York City, at the Florida International University in Miami, and at UCLA. A visionary, a dreamer, a social critic, an eternal optimist, a Futurist with a hailstorm of ideas, a Humanist, he was larger than life. *The New York Times* wrote: {STS} “Many of his ideas were prescient. {CCH}” As you read, you will see this is true.

The author may yet achieve his vision of immortality. In his own countdown, he is presently suspended at a cryonic facility in Scottsdale, Arizona, waiting to lead us to the Future.

Flora Schnall, Editor

Foreword

There's something I think you should know as you read this foreword, and this book. I'm dying.

I have a congenital degenerative condition that is progressive and, as I write, absolutely untreatable. It affects all my organs and tissues. So far, my symptoms are subtle – detectable only by an expert eye – but they will become increasingly debilitating with time and will certainly kill me eventually unless a dramatic advance in medical expertise arrives in time.

There's a ray of hope, however: “in time” is not particularly soon. The condition from which I suffer is, in fact, the slowest degenerative syndrome known to medicine. I will not exhibit severe symptoms for probably about another 15 or 20 years, and the chances are good that the condition will not take my life for a further 20-30 years after that. I'm essentially certain to be dead in under 70 years unless medicine saves me – but that's quite a long time in technology of all kinds, medicine included. And I'm dedicating my years of vigorous life to spearheading the search for a solution. You may have read Jonathan Weiner's excellent book *His Brother's Keeper*, which relates the storey of a mechanical engineer who gave up his business when his brother was found to have Lou Gehrig's disease, to dedicate himself to hastening the discovery of a cure for that. My situation is similar (I was a computer scientist originally), and in fact Weiner's next book, which may be out by the time you read this, will tell my story. In short, there's a very long way to go to develop a decisive treatment for my condition, but progress over the past decade has been most encouraging.

Unfortunately, there's a catch. The approach I'm taking to developing a cure is promising, yes, but it'll be really, really expensive to see all the way through to clinical availability (and, in case you were wondering, no one else has any cheaper alternative ideas). And I mean really expensive: much more than the billion dollars or so that it now takes to bring a single drug to market. This therapy will consist of a combination of many treatments targeting different aspects of the decay that I'm suffering. We'll probably need around a billion dollars (and around a decade) just to develop a proof of concept that the treatment works, by implementing it in mice. After that, it's hard even to come up with an estimate, but it'll almost certainly be at least 100 billion over 15 years. Not many diseases receive that sort of investment.

But the last step of my rollercoaster story of good and bad news is, I am pleased to say, a positive one. The chance of a given sum being spent to develop a treatment for a given disease depends very heavily on the amount that can be expected to be spent delivering that treatment once it finally materializes — and that depends more than anything else on prevalence: how many people actually suffer from the disease in the first place. And on this key point, I'm in luck, because my condition is very prevalent indeed. In fact, it's universal: you're dying too, of just the same condition as I. Two-thirds of all deaths are mainly due to this condition, and in the industrialized world it's close to 90% - and everyone who dies of something else does so only because that something else gets them at a sufficiently young age that the universal killer hasn't yet advanced to a life-threatening stage.

I'm talking about aging, of course. If you're thinking “hang on — don't most people die of cardiovascular disease, cancer, diabetes?” then you're right, but there's no contradiction because those are all simple aspects of the later stages of aging. We tend to use the word “disease” very carelessly in this respect: to erect an artificial and ultimately fatal separation between health conditions that different people get at rather different ages and the one health condition that we all get so much more gradually and more-or-less simultaneously. Whether aging is a disease or not is a matter of terminology; whether aging is a health condition is a matter of life and death.

In the first few chapters of *Countdown to Immortality*, the pioneering futurist FM-2030 makes this same case in his own inimitable style, one which I defy you to read without being inspired and energized to help in the crusade against this monstrous killer. But he doesn't leave it there.

I'm not fond of use of the word “immortality” to describe the limit of what we might achieve by technologically postponing our death — I think that word has already been taken by religion and defined very clearly, as an inability to die at any point in the future, whatever physical phenomena (supernovae nearby, etc.) may occur. But in recent years I've begun to soften on this point, because of a realization that there's an intermediate between “indefinite lifespan” (the sort that we would get if we defeated aging but made no other type of progress) and “infinite lifespan” (that is, true immortality).

Without getting too mathematical – you can find out the details by looking me up on the net – it turns out that, if we not only eliminate the increase with age in our risk of death (i.e., aging) but also progressively reduce (at a sufficient rate) our ageindependent causes of death, such as accidents and homicide, a proportion of those alive at the time we start to do that will live literally forever. Not everyone, so this can at best be called “possible immortality” – but it’s an extremely big conceptual departure from the “radioactive decay” situation (where some people live a really really long time – many “half-lives” – but everyone dies eventually) that would arise if all we did was defeat aging. Maybe the fundamental structure of the Universe will stop us from doing this – but maybe not.

There’s good reason to suspect that we will always maintain the size of the human race at somewhere near its current size – let’s say, under a trillion people even when we start to migrate into space. (Again, the details are too mathematical to rehearse here but you can find them easily enough.) If so, there will probably come a time (maybe only a million or so years from now) when the chance of a particular person ever dying is lower than the reciprocal of the number of people alive: in other words, when the chance of anyone alive at that time ever dying becomes low. That’s not truly strictly immortality, but it’s awfully close.

In this book – or, should I say, manifesto – FM-2030 guides us through many of these advances with an energy that should raise the sights of the most fatalistic curmudgeon. He wrote these words a decade ago, but I, as a leading researcher and thinker on these matters in 2010, find his reasoning almost entirely valid today. If anything distinguishes a true futurist from a mere speculator, surely it is that.

Aubrey D.N.J. de Grey, Ph.D.
Biomedical Gerontologist
Chairman and Chief Science Officer, Methuselah Foundation

CONTENTS

URGENT FLASH BULLETIN IMMORTALITY CHECKLIST

Part One: LetUsNotBeAfraidtoAcknowledge.....1	What is Deepest In Our Beings ๑– The Desire to Live Forever
Part Two: Questions About Immortality	19
Part Three: Countdown To Immortality.....	45
T-Minus 13 and Counting T-Minus 12 and Counting T-Minus 11 and Counting T-Minus 10 and Counting T-Minus 9 and Counting T-Minus 8 and Counting T-Minus 7 and Counting T-Minus 6 and Counting T-Minus 5 and Counting T-Minus 4 and Counting T-Minus 3 and Counting T-Minus 2 and Counting T-Minus 1 and Counting The Will To Live Forever.....	47
Resuscitation.....	53
Extending Life Expectancy.....	68
Extending Lifespan: Slowdown ofBiologicalAging.....	76
Telemedicine.....	81
Immortality Module - High- Tech Clothing	84
Freefly Intelligent Environments.....	88
Reconstructed Bodies.....	94
101 Modular Bodies	106
Streamlined Bodies.....	112
Replaceable Bodies	121
Durable Brains	131
IMMORTALITY AT LAST	143
THE COUNTDOWN HAS STARTED.....	153
AFTERWORD	157
URGENT FLASH BULLETIN - URGENT FLASH BULLETIN - URGENT	

We immortalists call on all people across the planet to join forces in a final heroic effort to overcome death.

Throughout the ages we have helped one another to prepare for death. Today we exhort everyone to help us do away with death.

If you believe that living a few short decades is our greatest tragedy -

If you believe that death is the ultimate denial of human rights -

If you are saddened by the daily deaths of fellow-people -

If you are saddened by the imminence of your own death -

If you have a romance with the future and want to revel in all the magical worlds ahead -

Then join in this greatest of all liberations so far - Immortality.

One massive final push and we will forever be out of the darkness. We will be immortal.

IMMORTALITY CHECKLIST

Measures Over Which Each Of Us Has Control

Develop the will to live forever. Update your attitude to aging and death.

Sign up with a cryonics suspension organization. In case of death you will be placed on hold.

Organize or join an immortality life net. Friends and immortalists who can be counted on to expedite rescue operations in case of imminent or actual death.

Always carry a cell phone with you.

Always have a tracer chip on you to help rescuers find your exact location.

Hook up with a telemedical service.

Learn Emergency First Aid.

Always have vital emergency information with you.

Adopt life-extending lifestyles: Vegetarianism - regular exercise - mental stimulation - stress reduction - tobacco avoidance - moderate drinking - plenty of leisure and fun.

If you look old - or think that your looks are aging you psychologically - update your look.

Participate in the immortality movement. Contribute time and resources to any area of science and technology that strives to advance immortality.

Measures That Have To Be Taken Collectively

(Government And Private Sector)

A Universal Declaration of Human Immortality (Ideally by the United Nations)

A target date to achieve Immortality.

A crash program to extend human life expectancy.

A crash program to extend lifespan.

A crash program to create universal protective telemedical services.

A crash program to create protective immortality clothing.

A crash program to develop individual vertical lift vehicles and levitation.

A crash program to introduce more and more intelligence into all areas of our communities.

A crash program to streamline our bodies.

A crash program to develop standby bodies.

A crash program to develop the capability to transfer our brains' contents to versatile modules that can enable us to go on living forever.

Have the courage to live. Anyone can die.

Robert Cody

PART ONE

LET US NOT BE AFRAID TO ACKNOWLEDGE WHAT IS DEEPEST IN OUR BEINGS —

THE DESIRE TO LIVE FOREVER THE DESIRE TO LIVE FOREVER

We are in the Age of Immortality.

Millions of us alive today will be around forever.

Millions of others among us will die and never be heard from again.

Who dies and who lives will depend more and more on whether you are oriented to death or to life.

If you are under forty you will probably never grow old. By the time you reach eighty we will have phased out aging.

If you are over eighty, you can now avail yourself of therapies to slow down, or even reverse, many of the disabling effects of aging — until a time when more radical lifesaving techniques are available.

If you are in a "terminal" phase - because of old age or illness or injury - you now have the option to be placed on hold - in cryonic suspension - until a time in the future when you will be reanimated and restored to health.

If you are around in 2020 - regardless of your age - you will have the options to be younger and smarter and lovelier than you are now - or have ever been in your life.

If these projections sound implausible to you it may be because you are not familiar with the accelerating multi-track nature of progress in our times. You may for example not be aware that medicine and biology are

only two of the sciences helping us extend life. As I will show in this book, more radical procedures are now coming on line.

Early signs of extended life are all around us.

Everywhere on the planet people are living longer and longer. Everywhere life expectancy is rising. The mortality rate for all societies is the lowest in history.

Millions of people are now over eighty-five and going strong. The U.S. Census Bureau projects that 114,000 Americans will be centenarians in 2010. Centenarians are no longer oddities.

Because of advances in medicine and in lifestyle (diet - exercise - smoking, etc.) people are aging more and more slowly. “Youth creep” is what the National Institute of Health calls it. Youth is creeping up.

We are continually redefining “middle age” and “old age.” We are even redefining death itself.

Yet for all these gains people still die every day. Often they die of easily avoidable causes.

Gerontologists talk of “premature death.” In our times all deaths are premature.

We need to come to grips with a basic reality: the human organism even at its prime is vulnerable to the ever-present danger of suddenly perishing.

You can be young and healthy yet a sneaky tumor or a vehicular accident or an assault or a natural disaster can suddenly terminate you forever.

The slowdown of aging will not protect us from death. A life span of one hundred and fifty years will not shield a thirty year old from sudden death.

“We will lick the problem of aging completely. Accidents will essentially be the only cause of death-” notes Dr. Augustus Kinzel - former president of the Salk Institute.

It is no longer enough to emphasize nutrition and exercise - no longer even enough to repair genes or replace tired organs.

We need more radical measures to overcome our inherent vulnerability to all internal and external threats.

The distinctions between young and old are blurring. Immortality now depends not on how old you are - but how well protected.

First we have to stop lying to ourselves. We have to stop denying what is deepest in our beings – the longing to live forever.

Each Death Is The End Of A Universe

The greatest tragedy facing each of us is death.

There is no sorrow more universal no anguish more profound no separation more final no horror more devastating than death.

“We are in a world limited by death and experienced in anguish - ” wrote Martin Heidegger - the existentialist philosopher

- several decades ago. “My future finite and I knowing it – that is my tragic situation in the world.”

“Death is the final assault ... on human freedom and dignity” noted B.F. Skinner, the psychologist, in his book *Beyond Freedom and Dignity*.

We think of specific events in history as holocausts. The fact is that all humanity lives through a perpetual holocaust.

Does it finally matter how or why or where people suffer and die? Does it finally matter whether people die of illness or through violence?

So long as there is suffering and death there is a holocaust on earth. We are **all** holocaust victims.

All fears are basically fears of death – psychologists remind us. Most neuroses stem from suppressed anxiety over death.

The panic over the breakup with the attachment-figure is basically a fear of death.

Death casts a dark shadow over **all** of life.

My mother died many years ago. For years after her death, often in the afternoons, I involuntarily thought to myself – I’ll now go over and visit her.

Each time I had to remind myself that I could not visit her – she was dead.

Is it possible that she is dead? Is it really possible that I will never see her again? Never?

Who has not experienced this deepest of all sorrows? We all go though life in the shadows of death. We not only have to bear the imminence of

our own end. A part of us dies with the death of everyone we love. We die a little with the death of every fellowbeing.

So long as there is death we cannot improve the **basic** quality of life.

So long as we are finite we all carry within us deepest anxiety – fear - rage - sorrow - helplessness.

So long as we cannot avert our own deaths - we have little control over our own lives.

So long as we are mortal we are not free.

To lose life is to lose everything.

Each death is the end of a universe.

What are we doing about death?

We are all quick to criticize less advanced societies for treating human life lightly. We forget that even in modern affluent societies we hardly do enough to protect each life.

It is because of a conditioned disregard for human life that we allow tens of thousands of people to perish in environmental and vehicular accidents every year – when in fact we have the technology to enhance everyone's safety.

It is because we are still careless about human life that we do not install rapid telemedical services to save the thousands of people who every year die because help arrived a little too late – a little too late.

It is because we are still resigned to our biological vulnerability that we do not hasten to create accident-resistant bodies for ourselves at a time when we spend millions of dollars every year designing smart bodies for robots.

It is because we do not fully value the preciousness of each life that we still allow people to die irretrievably by throwing them into graves and incinerators at a time when we should place them on life-support or in cryogenic suspension for later retrieval.

Every year we raise several billion dollars to help people **after** disaster or illness has struck – we hardly do anything to correct our **basic** vulnerability to illness and death.

We seem resigned to the inevitability of our mortality. We are traumatized by death.

The fact that for millions of years we were not able to do anything about death has made us all basically fatalistic and helpless.  "What is

the use of— in the end we die.?”

We don’t even feel we deserve to live forever.

Have you seen television programs of animals in the wilderness? A predator gives chase and hundreds of zebras bolt in all directions. Soon one of the zebras is brought down. As the predator immobilizes and kills its prey the other zebras stand around and watch. They just stand around and watch.

Seeing such spectacles I cannot help thinking of— why don’t these animals band together and chase away the predator? Hundreds of zebras collaborating could even stand off a **pack** of predators.

But they don’t. They go through the same gory spectacle hundreds of times and it never occurs to them to band together and protect themselves. How dumb. How programmed. How traumatized. But think of it of— are we any different?

We stand around like dumb zebras and watch as day after day fellow humans die all around us.

We even wait meekly for our own turn to die.

If we were not all so traumatized by death we would immediately put aside everything and mobilize our prodigious resources to subdue the predator death.

If you succumbed to a serious illness or injury would you just lie back and wait for death or would you do everything in your power to recover?

Every day of— every hour of— every minute - people’s lives are snuffed out forever. Someone suddenly collapses and dies of a heart attack. Someone else is killed in an automobile accident. Another drowns.

Tick tick tick of— every second someone somewhere dies. Day in and day out.

Who is next? Are you next? Am I next?

Going through life is like walking through a minefield of— you never know when you will step on a mine and be dispatched to the bottom of the universe.

When will this Russian roulette existence of ours give way to something more sane?

We are traumatized by natural disasters such as hurricanes and earthquakes mainly because we lose momentary control over our lives.

Imagine what repressed trauma festers in each of us at all times as we go through life never knowing when death might suddenly strike. How can we tolerate this ever-present uncertainty?

How can we who claim not to tolerate political and social oppression accept death 𐀀– the most brutal and basic of all oppressions?

How can we who mobilize so passionately to redress gender inequalities and human rights violations 𐀀– so meekly accept death 𐀀– the ultimate violation of human rights?

Struggling for social and political rights when we all face death is like arguing and fighting for rights while waiting on a short line leading to the death chamber.

Why do we continue to run away from our real problem?

The most basic and urgent crisis facing us all everywhere is death. All other human problems are derivative.

No priority is more urgent than the phase-out of our mortality.

The elimination of death will not do away with problems. It will free us of the tragedy in human life.

Aside from death no other problem is basically critical.

Once we attain immortality everything will be possible.

It is no longer enough to rage and rail against death as we have for thousands of years. Today for the first time we can do something.

Where in this vast universe of ours is it enshrined that death is inevitable? Where is it engraved that we have to suffer and die in these primate death-trap bodies?

If we can build houses and bridges and ships that last for centuries 𐀀– why can't we create bodies that can keep us going for millennia?

The elimination of death has never been a top priority at any time in any society because until now we have not been able to do anything about it.

Today for the first time we can do something about death.

Death is now suddenly a problem 𐀀– not an inevitability.

The time has come to shift our attention and resources from acceptance of death to its prevention.

Why don't we all get together and marshal our collective genius to wipe out this scourge of the ages?

Why don't we all pour out into the streets of our planet 𐀀– hundreds of millions of us 𐀀– and demand (of ourselves) 𐀀– an end to the

tyranny of death?

Why don't we set a target date to achieve Absolute Immortality for all the people of our world?

We who have broken free of this planet — we who are breaking free of our pristine vital organs — we who have broken free of countless arbitrary impositions of nature — can surely now mobilize our collective genius to set ourselves free of death.

The Bravest Revolutionaries Of Our Times

The bravest revolutionaries of our times are the scientists — researchers — transhumanists and others who directly or indirectly dare to challenge our oldest enemy — death.

Physicians and health care specialists who guide people toward wholesome life-extending habits.

Biologists and gerontologists and others who attempt to decode the causes of aging.

Bioengineers — prosthetists — transplant and reconstructive surgeons and others who bit by bit are redoing the human body.

Emergency physicians — paramedics — telemedics who every day make heroic efforts to save the dying and the dead.

Pioneering brain specialists who perform brain grafts and who look for ways to scan and eventually transfer the brain's contents.

Electronic engineers — designers of intelligent environments — geologists — weather forecasters — seismologists and others who give us early warnings.

Developers of ultra-intelligent machines and androids and microscopic robots. Also developers of lifesuits and vertical lift systems for "levitation" for quick get away.

Life support technicians and cryonicists who don't give up on anyone — not even the dead.

Space scientists who are helping us extend ourselves across the solar system and beyond — reinforcing the irreversible trend toward post-biological life.

Immortality activists who for years have faced ridicule telling a skeptical world that aging can be reversed and that human life can be extended indefinitely.

These and other activists are working toward the eventual conquest of death — though many of them are unaware of the long-range direction of their efforts.

At present there is little contact — much less collaboration — among these pioneers.

In the coming years the tracks will converge. Physical immortality will come into sharper focus. More and more scientists and others will have the confidence to acknowledge the obvious destination of their efforts.

When enough people realize that physical immortality is achievable then today's uncoordinated efforts may burgeon into a massive global movement — perhaps the most gigantic movement in history.

Meanwhile we need more public and private support — more funds — more research — more books and articles and films and television programs.

The absolute phase-out of death (from all causes) is a complex long-range process that entails advances in many fields.

No single scientist or engineer or inventor — no single discipline or industry or technology — no single corporation or nation can help us reach immortality.

No single foreseeable breakthrough will eliminate death altogether.

In the coming years we will see more and more progress toward open-ended lifespans. Each new technology or procedure will reduce our vulnerability. Each advance will move us a little closer to absolute immortality.

In the end it will be the cumulative confluence of advances in many disciplines that will enable us to live forever.

The step up from mortal to immortal is a major evolutionary leap. But more and more of us can make it.

We can speed up things. We can even place the dying on hold.

We need to foster an awareness of the preciousness of each life.

The loss of even one human life is a colossal tragedy.

We are not some throwaway object that lives for a few short anxious decades then is dumped like rubbish into a hole in the ground never to be seen or heard from again.

Surely we are more than this. Surely we ought to treat ourselves as more than this.

“Why was I born if not to live forever?” asked Eugene Ionesco the playwright.

People who aspire to live to a “ripe old age” are content with very little.

Even current life extension efforts are not enough. They are simply delaying tactics. They do not come to grips with the appalling ever-present vulnerability of life.

Let us stop beating around the bush. Let us not be afraid to acknowledge what is deepest in our beings – the desire not to die. The desire to live forever.

We immortalists are clear about our goals. We are not content to extend human life by a few years or a few decades. We want to live forever. We will settle for nothing less.

Death is a very dull, dreary affair, and my advice to you is to have nothing whatsoever to do with it.

W. Somerset Maugham

PART TWO

QUESTIONS ABOUT IMMORTALITY QUESTIONS ABOUT IMMORTALITY

To mobilize people to embrace immortality we have to break through massive ancient barriers.

Questions have to be addressed – skepticism dispelled – inertia and resignation overcome.

We have to erase profound doubts – not only about the feasibility of immortality – but also about its desirability.

The dramatic prolongation of human life and the development of super intelligent machines are triggering many questions and objections. This in itself is a good sign.

Until recently hardly any questions were asked. Few were even aware of such developments. Fewer still took them seriously.

Today questions abound:

If we live on and on how will we provide for everyone?

Who wants to be aged and infirm for hundreds of years?

Won't an older population be tradition-bound and slow down creativity and growth?

Should we not focus on the **quality** of life rather than on its prolongation?

How can we in just a few decades transcend the biological makeup of millions of years and emerge as post-biological life forms?

These and other questions reflect unfamiliarity with the dynamics of human progress.

Here are some of the questions and doubts expressed with increasing frequency these days.

If in the coming years people live longer and longer and few die how will we feed everyone?

This is a revealing example of single-tracking. One track (lifeprolongation) is played forward but other tracks are suspended — as though only the prolongation of life were advancing and nothing else.

How will we provide for everyone? Play forward **all** tracks.

Food production and availability of raw materials depend heavily on energy. Our world now has access to a glut of fossil fuels. In the coming years we will have access to limitless sources of cheap energy: solar - wind - ocean thermal - hydrogen fuel - fusion and other sources.

The world is already producing surplus food. The supply of food will continue to accelerate: through computerized telefarming — crop breeding via genetic engineering — controlled-environment agriculture — hydroponics — global satellite-monitoring of agriculture — opening up vast regions of earth for cultivation. We are also developing better systems of storage and transportation of food (which are the **real** problems in the less developed areas today).

In the 21st century food will be less and less of an issue because — as I will explain later in this book — we will sustain ourselves in more efficient ways.

Abundant energy also means abundant raw materials. From petrochemicals — from untapped regions of this planet — from earth's interior — from the ocean floor and from space.

Immortality and abundance are part of the same continuum. We cannot have the one without the other. As we evolve into immortal beings we also open up the abundance of the universe: abundant time — abundant space — abundant growth — abundant riches.

If the mortality rate continues to drop sharply where will we put everyone?

This too is single-track. Accelerating rise in life expectancy in the coming years presumes advances in many fields: medicine — genetics — technology — telecommunication — economics — values — Space inhabitation.

To bring into focus a clearer image of where we will put everyone you have to allow for advances on all tracks.

In the coming years people will continue to reproduce less and less (this itself a result of greater affluence — better birth control devices — liberation of women and men etc.)

In the years ahead we will also continue to open up and inhabit more and more areas of the world. (This too a result of obvious advances in many tracks.)

In the coming decades we will spread out farther and farther in extra-terrestrial Space: earth-orbital colonies as well as lunar and planetary communities.

Where will we put everyone? This is a non-issue. Millions of light-years of space — that's where.

Who wants to be aged and infirm for hundreds of years?

Extended lifespan assumes advances in anti-aging techniques — bioengineering — total body reconstruction — body replacement and so on.

It is not possible to live for hundreds of years in these bodies these brains or with the current state of medicine.

Aging and infirmity are **today's** problems — not tomorrow's.

In recent decades we have eradicated many crippling diseases that were with us for thousands of years. Today we are attempting to eliminate the remaining infirmities.

“Humans have within reach the capacity to control or prevent disease.” The President's Bio Med Commission has reported.

“There do not appear to be any impenetrable, incomprehensible diseases. This in itself represents the major advance for biomedical science ... Although there are innumerable questions to be answered the questions are at last here and explorations in search of the answers are underway...”

As I will attempt to show in this book aging and infirmity will not be widespread problems in the future.

Won't an older population turn societies more traditionbound and resistant to progress?

"I was never as old as I was between twenty and thirty" – wrote V.S. Pritchett, the English writer, at the vigorous age of seventy.

It is a myth that as people grow older they automatically grow resistant to progress. As a rule people mature within their basic ideological grooves. The young conservative grows into an old conservative. The young progressive mellows into a more daring progressive.

But something new is happening. The world's ideological base is shifting. In the past when conditions changed slowly the world was basically conservative. We are changing from a basically conservative world to a basically progressive one.

In our times the "conservative trend" is a myth. When there is an apparent shift toward conservatives in some area it is a "conservative trend" within a basically revolutionary thrust. We are **all** on a fast track – even those who appear to be standing still.

In the coming years the world will grow more and more progressive. Briefly here are some of the reasons:

Globaltelecommunicationandtheglobalspreadofwealth will continue to speed up the radicalization of ideas and values.

Geneticrejuvenationandcognitive-enhancingtechniques will help us grow more intelligent and creative. Distinctions between old and young will continue to blur. The eighty year old of 2020 will be youthful and vigorous – nothing like the eighty year old of 1970.

Theinevitabilityofdeathmadepeoplebasicallycautious and devout. As we break through the aging and mortality barriers we will grow more daring. Why hold back when you have an eternity ahead?

Radicallynewenvironmentsacrossthesolarsystem(and beyond) will revolutionize all areas of our lives – wherever we are. We will continue to grow progressive as long as there is a universe to grow in.

Will life not become redundant and boring if extended for hundreds of years?

Boredom is a human experience because humans (like other animals) are obsessively redundant.

We go through an entire lifetime blackholed within the same body the same intelligence the same set of emotions the same memory bank the

same identity the same environments the same world.

We are dead-ended in redundancies. Little wonder we get bored and tired — even within the relatively short lifespan of a few decades.

“I am tired of being Greta Garbo” the reclusive actress was reported to have complained at the age of eighty.

The more primitive we were the more redundant our lives. The more we advance the more fluid we grow. To people of a hundred years ago the relative fluidity of today’s life would have been astounding.

Modern people in their fifties and sixties start new lives — changing homes and careers — embarking on new love affairs — undergoing reconstructive surgery to alter their looks.

In the coming years the recombinations of life will grow even more profound. We will turn reality upside down in fundamental ways.

“Am I tired of this body?” We will one day soon ask ourselves. “I will transfer to a brand-new body.” “Am I tired of playing back the same memories? I will plug in new entries into my memory bank.”

“Am I restless because I have hung around this world too long? I will switch worlds. What about one of the new habitats in the Asteroid Belt? Or one of the colonies on Mars?”

In the coming decades looping and redundancy will recede. As transhumans we will continually reinvent ourselves and our worlds.

What about reincarnation and other life-after-death scenarios?

Our ancestors could do nothing about death so they wisely went around it — they invented life **after** death. It is partly because religions offer hope of immortality after death that has accounted for their durability throughout the ages. How else could people have coped with the brutal finality of death?

There has never been a shred of provable evidence to support any account of a hereafter. Fairy tales about life after death may have worked during humanity’s infancy. In our times more and more people have difficulty with such unsubstantiated stories.

“Do you believe in life-after-death?” a man was asked in a *Newsweek* magazine interview. He shook his head. “My father died fifty years ago and I still haven’t received a post card from him.” Even allowing for today’s slow mail a post card should have arrived by now.

In our times the damage of holding on to life-after-death myths is that it diverts attention and resources from our efforts to overcome death.

Why give up on this life chasing after immortality in some imagined life? Let us go after what is certain.

What is certain today is that more and more people are living longer and longer. What is certain today is our new-found ability to extend each life significantly.

But we need more and more support for this Herculean life-and-death struggle. The time has come to stop supporting mythologies that promote placebos of a life-after-death.

Do not listen to those who accept death ☞— they do not feel they deserve life. They are evolutionary drop-outs.

Listen only to those who aspire to immortality ☞— they are the Future.

What is so sad about death after a ☞“full life?”☞

☞“My neighbor was eighty-five when she died. No reason to be sad ☞— she lived a full life.☞”

☞“Sam Jones died last week at the age of ninety-two. He lived a full life.☞”

A full life?

How pathetic that we consider a few fleeting decades a full life.

We have for so long been resigned to a few years of existence that we are grateful to live to eighty or ninety.

By no stretch of imagination can anyone ninety years of age be said to have lived a full life.

Not long ago sixty years was considered a full life. Today sixty is considered middle age. People start new lives at sixty.

One day soon as we grow more daring we will realize how tragically short a ninety-year life is.

It takes over a hundred years just to let go of our caution and fears and gain the confidence to live life.

It takes hundreds of years to begin to understand the complexity of life and explore the solar and galactic neighborhoods.

It takes time to grow young. The longer we live the younger we grow.

Why fear death?

We immortalists strive for immortality not because we fear death — but because we love life. Immortality is an affirmation of life.

To those of us who keep the future in focus — who see beyond today's problems to marvel-filled eons ahead — death is particularly tragic.

I have been thinking and writing about the future all my adult life. I began teaching future studies in the early 1960s when futurism was considered “a course for kooks and weirdos.” The study of the future has been one of my principal professions and joys.

Yet I confess that I do not have the vaguest idea of how or who or where we will all be a hundred years from now. From here on the Time/Space shifts will be so profound and exponential that there is not a person alive anywhere whose remote-sensing can see that far ahead.

The only thing I am reasonably sure of is that our transformations in just the next one hundred years will be greater than the advances we have made in the last four **million** years.

And that is only one hundred years from now. Who and where will we be in 200 years? In a thousand years? In a million years?

We are only at the beginning of things. We are in the childhood of our evolution.

To die now is like being yanked away from a festive garden party — just as it is about to start.

To die now is like suddenly dying at the age of ten — just as life is starting.

To die now — just when things are beginning to crystallize for us — just as we are at last breaking free of our primitive mortal stage — is to miss the best parts of our evolution.

To die now is to miss everything.

Why not accept aging and death with dignity?

Death with dignity? What carbon monoxide. There is no dignity to aging. No dignity to dying.

Death is the ultimate indignity.

In our times the only dignity is in valuing life — taking all measures to live forever.

Are we not part of the animal world and like all animals do we not wear out?

We started out as animals but we are fast transcending our origins.

Do you know of any baboons that perform genetic recombinations? Have you heard of hyenas that do implants? Do you know of elephants steering shuttles to other planets?

The study of animals tells us a lot about our **past**. It sheds no light on our **future**.

Our linkage to our primate origins is useful only as far as it goes. More instructive now is our linkage to the future **᠙**– the emerging life forms.

Why persist in defining ourselves only in the framework of our animal origins? We are fast emerging as a dynamic new presence in the solar system. We need to create new models for ourselves.

As primates we swung from trees. What matters is that we are now swinging across the solar system.

One day we will swing across the Universe.

Isn't it human to age and die?

Yes it is human to age and die.

We humans like all biological organisms are physically and psychologically terminal.

That is why it is important that we hurry up and evolve beyond the human.

As humans we can never be immortal. It is not possible to live forever in these biological bodies.

In creating post-biological structures we phase-out the animal in us. In phasing-out the animal we phase-out the human.

Transform these bodies into durable or replaceable forms and what will inevitably emerge will be **᠙**– not a more advanced human **᠙**– but a new being.

To be immortal we have to transcend the human.

Aren't we giving up a lot just to be immortal?

We are giving up nothing **᠙**– nothing but our dumb animal bodies and the primitive instincts that evolved to protect our fragility.

What is so sacrosanct about humans? The human is only a stage in evolution. A stage between the animal emerging and the emerging ultra-intelligent Space-free Time-free post-human.

Isn't it natural to die?

If it is natural to die then to hell with nature.

Let us rise above our nature. Let us refuse to die.

Every day we are challenging the limitations of our nature.

Isn't it natural to die when your heart or liver has conked out?

Isn't it natural that new life be fertilized and carried in the body?

Isn't it natural that we go through life with the genetic imprint we were born with?

All this **was** natural at one time. But no more. We are altering the nature of nature.

If it is natural to die then we will continue to upgrade our nature so we do not have to die.

Doesn't death help ensure the survival of species?

Death presumably meets the survival needs of species in at least two ways:

First. Death insures a balance of nature. Organisms die to make room for new generations which perpetuate the species. Death presumably makes room within a finite habitat containing finite resources.

We humans have now broken free of biospherical limitations. We are emerging in a limitless universe of limitless space and limitless resources.

No one need die to make room for others. We no longer need a balance of nature to insure our perpetuation. There is overabundance for everyone for billions of years to come.

Second. Death serves another evolutionary function. It removes the disabled old to make way for the vigorous young. New generations shed the archaic and reinforce the dynamic to carry on.

We now have more refined ways of regenerating the species. People are growing vigorous until later and later in life. Many of the creative and visionary people of our times are over sixty and seventy. "I grow more daring as I grow older." The philosopher Montaigne's puzzlement is becoming a universal reality.

We are now in the process of creating durable bodies and brains. No one need die to ensure the weeding-out process of evolution.

We will soon overcome death because death has lost its evolutionary utility. The death of the individual no longer benefits our species in any way.

Death is obsolete. No one need die any longer.

We are so scripted to accept death that it will take a few years for this new reality to sink in.

We are now more than primitive biological organisms whose sole function is to reproduce then die.

We are more than just reproductive puppets to serve some arbitrary balance of nature within a closed-ended primordial environment.

We are now more than throwaway items to be discarded and forgotten after a brief flicker of existence.

Human life is evolving beyond mere survival and reproduction.

We now have more sophisticated things to do in the Universe.

Isn't there a maximum lifespan for each species?

Yes, there is. Twenty-four hours for flies. Thirty years for horses. Fifty for apes. Around 115 for humans.

This is the maximum lifespan inherent to each species.

Average life expectancy for humans is increasing. We are living longer and longer. But **maximum lifespan** for our species has not changed in thousands of years. There are no validated records showing that anyone has ever lived much longer than the 115 year ceiling.

Maximum lifespan for each species is therefore a fundamental fact of life.

But this is not the only fact. Another fact: our species does not appear to recognize any immutable laws of nature. We are a species continually breaking out of our natural bounds.

The maximum lifespan of rats is three and a half years. But I know of no rats that fool around with their genes or perform brain grafts or pull off memory transfers or are in any other way in hot pursuit of immortality.

Isn't the human body a marvel of nature?

The human body is a disaster. It has made us all nervous wrecks.

We have recalls of defective automobiles and computers. Why isn't there a recall of the human body? "Bring back your bodies. They are all defective. They break down easily and need constant costly repairs. They use a lot of fuel – you have to recharge them several times a day. They have loose wirings and they leak all the time.

These bodies need to rest frequently – around eight hours every day. Your bodies are death-traps – just as you begin to enjoy your body the motor conks out and that's it – you have to be discarded.

It is precisely because the body is shoddily put together that our heads are so messed up. We live in perpetual fear of conking out. No wonder we are so jumpy and self-involved.

The human body is an old model. We haven't had any basic improvements in several million years.

Take a good look at your body: your arms are the same arms that swung from trees millions of years ago. Your feet are basically the same primate feet that ran across pristine plains. Your stomach and intestines are similar pouches that processed food when we grazed on all fours.

The human body was created by designers who had no access to computer graphics. No designer today would come up with such a flawed model.

People who rave about the human body are content with very little. Give us a few years and see what marvelous new bodies we will create. **Everyone** will be able to turn in the old model and obtain new designs.

In the years ahead more and more people will consider the human look archaic. Even a young vigorous body will have an old look about it. The new smart look will be something other than the human form.

Why give up the pleasures of the body?

We assume that physical pleasures will always be gratifying to us.

Climbing trees was very satisfying at an early stage in our evolution. Having eight children was very romantic until a few decades ago.

Physical pleasures have meaning within the context of our flesh-and-blood survival needs. How long will love-making (mating) remain exciting after we have developed non-mating ways of replicating ourselves?

Will eating still be pleasurable after we have created new efficient ways of energizing our systems?

I once asked my UCLA (Extension) class in Future Studies  "Would you rather eat or live forever?" 

 "Eat! Eat!"  someone shouted.

The fact is that so long as we hold on to our primate bodies we are holding on to our past. To be content with biological pleasures is to settle for very little.

What will bring us pleasure when we evolve beyond survival needs? This is difficult to foresee because we are profoundly committed to our age-old biological imperatives. We **think** in a biological framework.

The pleasures we enjoy in our present animal state will be modest when compared with the activities we will  "enjoy"  later in the new century.

Won't replacement parts eventually turn us into machines and robots?

Why insult the robots? It is we humans who are rigid and mechanical. We are just too embarrassed to face it.

The fear of being "robotized" comes from a fear of letting go of the robot in ourselves. We do not want our rigidities tampered with.

In fact the more primitive the life form the more rigid and mechanical it is. Is there anything more automated than ants or bees?

Are there any people more mechanical than primitives? Visit a backwater tribe in the Amazon and see how quickly you'll predict everyone's moves.

Our biological bodies are absurdly mechanical. At regular intervals we breathe in breathe out π — we have to eat and drink and sleep. Disrupt our patterns and we quickly fall apart.

One morning we wake up in high orbit π — another morning we wake up in the dumps π — for no obvious reason. One day we walk around hornier than a rabbit, another day coitus might as well be a penal colony in Mongolia.

What's going on? Who is running the show here?

So long as chemistry controls our brains there can be no free will.

Now at last a breakthrough. As we replace more and more of our dumb parts with intelligent components, we gain increasing control over our selves. We grow less and less mechanical and predictable.

Only after we have created intelligent bodies will we enjoy total autonomy. One day there will be free will.

Won't artificial organs and bodies lead to artificial people?

There are no artificial organs no artificial senses no artificial intelligence no artificial life.

There is no artificial anything. Only biological fundamentalists use such artificial terms.

Anything that is of this world is intrinsic to it and therefore cannot be artificial.

Why do we regard the zinc or copper in our bodies as natural but consider these same minerals as artificial when we introduce them into our bodies in the form of replacement parts?

Are the millions of people with prosthetic knees and heart valves artificial? When does a person cross the borderline from natural to artificial?

What is so special about flesh-and-blood? A donkey's ass is also flesh-and-blood.

Synthetic replacement-parts and synthetic bodies are central to the emerging post-human and therefore part of our evolution.

Anything that helps us transcend our ridiculous brittleness – anything that helps us overcome aging and death – anything that helps us evolve into more advanced beings – is part of the natural process of evolution.

Why prolong life if there is no “quality of life?”

What is all this nonsense about quality of life?

What is the quality of life when you are dead?

I would rather be alive with a low quality of life knowing that given a few years my problem – however serious today – will be treated and my quality of life will soar far into the future.

How can we in just a few decades transcend the biological imperatives of millions of years and emerge as postbiological life forms?

We humans are remarkably adaptable. This very day we are shedding the biological baggage of millions of years. Here are some examples:

Suddenly millions of people are consciously not reproducing at all. Others are reproducing in ways entirely new to our species: insemination - in ovulation - telegensis - embryo transfer - in vitro fertilization.

Suddenly millions of people are deviating from homo sapien circadian cycles - living at night and sleeping during the day.

Suddenly millions of people are walking around with body parts made of polyurethane - aluminum - electronics.

Suddenly death is not what it has been for millions of years - we are now reversing more and more deaths.

Suddenly we are decoupling from this planet operating in environments where no earth-spawned flesh-and-blood organisms had probably ever been in before.

These are a few fundamental departures from millions of years of biological scripting. How are we coping? Splendidly. In fact we hardly pay

attention to these evolutionary accelerations.

Our reconfiguration into post-biological beings will speed up in the coming decades. Beyond mid or late 21st century we will have evolved into more advanced life forms. By then the whole context of life will have shifted and therefore our new situation will be the norm. We will hardly even notice that we had gone through a timewarp.

Doesn't the Second Law of Thermodynamics in physics indicate that everything in nature eventually decays and dies?

This is just a theory and like most theories it issues from incomplete information. As we learn more about the nature of the Universe we find that this theory of inevitable decay may itself be decaying. We can expect many surprises ahead.

“The stage physics has reached at the present day is not the final stage” — wrote Paul A.M. Dirac, one of the luminaries of 20th century physics. “It is just one stage in the evolution of our picture of nature, and we should expect this process of evolution to continue in the future, as biological evolution continues into the future. The present stage of physical theory is merely a steppingstone toward the better stages we shall have in the future.”

“There is no principle in nature that says that living things cannot go on functioning indefinitely in optimum health.” wrote Dr. Bernard Strehler, pioneering biologist - formerly at the University of Southern California.

Ilya Prigogine, the Belgian seminal chemist, has conducted chemical tests that counter the classical law of eventual decay.

“Dr. Prigogine's work seems to him to imply a physical principle never fully perceived before - a fundamental impetus inexorably pushing life and humanity to further evolution and complexity.” Malcolm Browne wrote in *The New York Times*. “He likens this strange positive force to one he has studied intensively in the new discovered classes of chemical and physical reaction that seems to reverse nature by running uphill.”

“Dr. Prigogine's complex equations show that although everything man has ever observed runs downhill, there are cases in which local ‘open’ systems can run uphill. They do so against the general tide, by interacting with that tide, gaining vigor and complexity from its

downhill slide and dumping their own decay or entropy into it. He calls these systems 'dissipative structures' because they can dissipate their entropy into the environment with which they interact."

"This is something completely new, something that yields a new scientific intuition about the nature of our Universe. It is totally against the thermodynamic view that information must always degrade. It is as if you will something profoundly optimistic."

The evolution of the human species itself is a refutation of the theory of entropy. This strain of life we call human is breaking away from the mainstream of all terrestrial life. We humans are reorganizing our molecular composition in entirely new ways transforming ourselves into trans-biological then post-biological extraterrestrial life forms with the potential to evolve forever.

Is immortality our ultimate goal?

There are no ultimate goals.

Once we set up ultimate parameters, we foreclose the future. We set limits. Our future has no limits, therefore nothing is ultimate.

Immortality is an ultimate breakthrough only at this mortal stage in our evolution. But immortality is only one of many milestones on a long evolutionary trajectory.

Previous milestones: the transformation of energy into matter and matter into energy - the coalescence of animal life on this planet - the emergence of hominids - the break-out from this planet.

Milestones coming up:

Debiologization of hominids

Emergence of synthetic ultra-intelligence

Evolution from human to post-human

Immortalization of intelligent life

Immortality and Space migration are rare evolutionary breakthroughs. They are only momentum-swings to yet more powerful milestones ahead.

Give us a few more decades then no matter how colossal the problems, we will find a way out - no matter how unattainable the goals we will find a way in.

Give us a few **centuries** then who knows what we won't be able to do.

For all our vestigial crudities, we humans seem to have the makings of an extraordinary new presence in the Universe.

If you live to be one hundred, you've got it made. Very few people die past that age.

George Burns

I don't want to achieve immortality in my work... I want to achieve it through not dying.

Woody Allen

PART THREE

COUNTDOWN TO IMMORTALITY T - MINUS 13 AND COUNTING DEVELOPING THE WILL TO LIVE FOREVER

“We die only when we are ready to die... We die because unconsciously we want to die... If we truly wish to live, if we have something to live for, then no matter how sick we may be, no matter how close to death, we do not die. We live because we want to live.”

Dr. Arnold A. Hutschnecker, author of *The Will to Live*.

“Aging is mainly psychological - not biological ... Everything in our society tells us that as we grow older we will lose our mental powers, our health, our sexual capacities. We start believing it all, and because we believe it, it begins to come true. But it doesn't have to be this way ... 75 percent of so called aging results from a kind of self-fulfilling prophecy.”

Dr. Alex Comfort. Dean of English gerontologists and author of *The Good Age*.

To live forever you must first consciously want to live forever. “To want to want to live on and on” as Miguel de Unamuno put it.

We are terminal organisms - physiologically and psychologically programmed to die. To live forever we must alter the scripting of millions of years.

We still live in the death-dominated psychology of the past. We persist in playing back outdated “verities”: “As sure as death and taxes. Death is inevitable. Isn't it time you settled down?”

Every day we are made to feel that we are losing our vitality. Even when we are full of life, we are told and tell ourselves that we are no longer young because we are now thirty - because we are now forty - because we are now sixty - because we are now eighty...

We program ourselves to age. We program ourselves to die.

When you lose the will to live, nothing can save you.

If we can program ourselves to die we can also program ourselves to live far into the future.

Each of us can begin by consciously rejecting self-fulfilling attitudes to senescence and mortality.

Reset your orientation from mortal to immortal.

Auto-suggestion and hypnotherapy can be helpful tools.

Read aloud or recite the following suggestions. Alter the wording and the emphases to suit your specific needs. (For example you can include **specific** life-extending measures. See checklist at the beginning of this book.)

You may also tape-record these suggestions - in your own voice or in someone else's - and play them back often.

For maximum benefit do the auto-suggestion when you are relaxed and therefore in a suggestible mode:

Disconnect your telephone and other sources of distraction.

Sit up in a comfortable chair or lie down on a sofa.

Close your eyes briefly and take a couple of deep breaths for greater relaxation.

If you are in hypnotherapy or psychotherapy, ask your therapist to incorporate these or other immortality suggestions into your therapy. (Such suggestions are themselves therapeutic and can potentially bolster your confidence and dissipate depression and anxieties about aging and death which are at the root of most human neuroses.)

The following suggestions will work only if **you** want them to work.

Millions of us alive today will be around one hundred years from now.

I want to update my attitude to aging and death.

I am now aging more and more slowly.

“Youth creep” - health specialists call it - youth is creeping up.

People are staying youthful longer and longer.

What was old in the past is young today. What is old today will be young in twenty years.

If I have the vitality and the looks of someone much younger, I am not deluding myself - I **am** younger.

I am now biologically several years younger than my chronological age.

From here on my biological and psychological ages will guide me - not my chronological age.

There are no “age norms” any longer. Millions of people are now changing professions and starting new lives at forty and fifty and sixty and

seventy and eighty and ninety.

I will not be an ageist. I will not act my age. I am not too old or too young for anyone or anything.

In the coming years we will slow down aging even more dramatically.

In ten years I will probably not be ten years older - I may only be three or four years older.

I can now make ST5 "lifestyle changes ECH" to slow down my aging even more.

This is now within my control.

Death is no longer inevitable.

Death is now a biological problem which like other biological breakdowns can be reversed.

For the first time ever we can see a way out.

We will soon have ways to extend each life far into the future.

I may never die. I may live forever. I **want** to live forever.

I want to remind myself that we humans have been successful in obliterating many age-old diseases and other threats to our lives.

This very day people live with transplanted and implanted hearts and kidneys and lungs.

Everywhere on the planet people are living longer and longer. We have walked on the moon.

We have lived out of this world for a year at a time.

We have accomplished feats which at one time were regarded as fantasies.

We can now attain another of our age-old fantasies - physical immortality.

I will do whatever it takes to contribute to this effort.

I will do whatever it takes to hasten the day when **no one will die**.

I myself wholeheartedly want to live forever.

I will never again be resigned to aging and death.

I will never again run away from death. I will squarely confront death and say out loud: ST5 "Death! I am not intimidated by you. I am joining forces with others to do away with you! ECH"

I will reinforce my desire to live forever through frequent autosuggestion and hypnotherapy.

I will take whatever measures are necessary to increase my chances of extending my life to a time in the new century when it will be possible to coast to immortality.

Above all I will not wait for immortality to happen. I will make it happen.

I see myself in the future.

I see myself reveling in all the marvelous advances of the coming decades.

I see myself in the years ahead - healthy and vigorous and happy - flourishing in a world where there is no aging and no death.

I see us all in the decades ahead - free of death and therefore gentler and more trusting and optimistic than ever.

I am uplifted by the prospects ahead.

I want to be around in the future to enjoy the abundance of a limitless and timeless universe.

I wholeheartedly look forward to the future.

I accept all these suggestions unequivocally.

I will incorporate them into my conscious and subconscious mind and they will become for me the new reality.

T - MINUS 12 AND COUNTING

RESUSCITATION

 “We resuscitate the brain. What used to be thought of as dead, we no longer think of as dead. We have to change the legal definition.” 

Dr. Jewell Osterholm, Chairman, Department of Neurosurgery, Thomas Jefferson University.

 “Each time a cryonic suspension is done, the techniques become better and another small step is gained toward the future goal of demonstrating that this technology can preserve life function in a suspended state.” 

Robert J. Morin, M.D., Professor of Pathology, Harbor-UCLA Medical Center.

What if during these transitional decades to immortality you are suddenly trapped in a terminal illness or fatal injury? Is all lost forever? Is there finally no protection from death?

Will you be one of those who will miss immortality by just a few years? To die now is like perishing on the last days of a war.

We are in the final phase of our long war against death. In an evolutionary time-scale we are now near ground zero.

In the coming years we will continue to reduce the threats to our lives. We will **reduce** the threats **⚡**— but we cannot yet **eliminate** them. Accidents and killer diseases will continue to take their toll.

We cannot soon wipe out death but we can do something else - we can **reverse** death.

For the first time ever we are actually retrieving people from death. We are reviving victims who suddenly have no heartbeat, no pulse, no respiration, no vital organ function. We are even resuscitating some people in the early stages of brain death.

We are saying that today a person who is dead is not necessarily dead forever. We may be able to reanimate such a person. We are doing this every day.

We cannot yet bring back **everyone** who dies. But we can retrieve more and more people.

Emergency Resuscitation

In case of sudden death, what are your chances of revival?

Much depends on the cause of death - where you are - how soon after death you are found - how speedily resuscitation or suspension measures are activated.

The chances of revival depend on rapid telecommunication, rapid transportation, rapid emergency care and, if necessary, rapid suspension. The more rapid the entire reanimation effort the better the chances of snatching you back from the black hole of death. Emergency medicine is a relatively recent specialty. It grew in part from advances in emergency mobilization during recent wars.

Mortality Rate Among Wounded Soldiers in War Time

Pre-Twentieth Century Wars World War I

World War II

Korean War, Mobile Army Surgical Hospital (MASH) Vietnam War

Around 75 percent Around 8.5 percent Around 6 percent

Around 2.4 percent Around 1.7 percent

In the 1970s health care administrators began to realize that a critically wounded soldier on a battlefield had a better chance of recovery than a city-dweller injured in an accident. The American College of Emergency Physicians grew in part to meet the need.

More and more hospitals now have clinics staffed with physicians and nurses trained specifically to deal with emergencies. But an alarmingly high percentage of hospitals - even in North America and Europe - still do not have adequate emergency services.

The clinically dead (heart and respiratory arrest) are now revived through manual or electrical stimulation of the heart - administered

respiration - blood transfusion - emergency medication (such as drugs to impede brain swelling and irreversible death).

Clinically dead victims of severe head trauma and drowning are now brought back through cerebral resuscitation procedures. The victim is placed on life support systems. The body temperature is lowered to decrease metabolic rate and lessen the oxygen requirements of the brain. The patient is kept in a coma while medication is gradually administered and the necessary amount of oxygen delivered to the brain. The patient is then revived through gradual rewarming of the body.

“Suspended animation, a staple of science fiction, is now being used at a few hospitals to allow surgeons to operate on certain badly deformed blood vessels (aneurysms) that cannot be repaired while full of blood...” reports Elizabeth Rosenthal in *The New York Times*. “At a body temperature of 60 degrees, almost 40 degrees below normal, the brain can survive an hour without blood flow.”

This life-saving medical technique which “cools the patient to near death” is known as hypothermic arrest.

What if you are brain-dead — “reduced to a vegetable?”

A vegetable? Why give vegetables a bad name? Why not say reduced to a hamburger? Have you ever seen a hamburger jump up from a plate and announce, “Hey, I feel great?”

Brain death may be brain-injury and reversible.

“No criteria exists to assist in the evaluation of the patient who has suffered severe brain damage, rather than brain death, as a consequence of cardio respiratory arrest,” cautions Mark A. Goldberg, Chairman of the Department of Neurology at HarborUCLA Medical Center. “We don’t know precisely where in our brain all of the higher functions that contribute to our humanness are located. Current laboratory methods for determining which brain cells are irreversibly damaged and which may recover are inadequate.”

Today we are resuscitating more and more brain-injured and even brain-dead patients.

New techniques now rehabilitate many stroke victims. Thickening or thinning of blood - enriching spinal fluid - cerebral bypass operations have all helped reverse the crippling effects of catastrophic strokes in some people.

“Laboratory animals left brain-dead by strokes have been revived, with all their functions intact, by enriching their spinal fluid with oxygen” reports *The New York Times*.

“Already the procedure has led to renewed debate on how to define death. The brain is much more resilient than previously thought.

“We thought that the brain dies within a few minutes, we have evidence that this isn’t so. The brain hibernates, idles,” says Dr. Osterholm, head of the team that has helped stroke victims walk and talk again and go back to work.

Long Term Suspension

What if emergency resuscitation efforts fail? Or what if a person is terminally ill with no immediate prospect for recovery?

There is now hope even for such people. We can place them on hold and attempt resuscitation at a later time.

The terminally ill and the clinically dead are now kept on respirators - heart assist devices - feeding tubes and other supports for months - even years. Sometimes a victim recovers from a prolonged coma. However the main purpose of these life support systems is to postpone absolute death.

But in our times when cures are fast coming on line, such measures can actually help us gain time until a way is found to treat the terminal illness or reverse the clinical death.

In other words, such people can now be placed on life support not simply to postpone death - but to await treatment. (However if there is brain deterioration, these people should immediately be transferred to cryonic suspension.)

At cryonic centers dedicated researchers are refining freezing techniques for long-term suspension immediately before or immediately after death.

Dead mice - rats - hamsters - dogs, have been chilled then rewarmed back to life with no damage. The brains of cats and dogs and hamsters are also placed in low temperatures then revived.

Elsewhere embryos of goats and sheep and cattle are routinely frozen for years then thawed and implanted in foster mothers for gestation.

We also routinely freeze or keep in cold storage for reuse parts of the human body: hearts, kidneys, livers, tissues, corneas, skin, bones, nerves, blood, sperm.

Have we ever frozen people and resuscitated them? Yes, we have - if you are one who considers an embryo a person.

We freeze human embryos for extended periods then thaw them out and implant them in wombs. These frozen embryos go on to develop into healthy human lives.

It does not take genius to see that we are rapidly developing the capability to successfully freeze the dying or the dead then months or years later coaxing them back to life.

“Most of us now living have a chance for personal, physical immortality-” wrote Robert Ettinger, one of the early advocates of life suspension. “At very low temperatures it is possible right now to preserve dead people indefinitely, with essentially no deterioration.”

Skeptics insist that once a person dies, that’s it. You can’t bring back such a person. Therefore suspension is useless.

The fact is that every day people die - and we do the impossible - we bring them back. Today we revive them shortly after death. One day we will revive them months or years later.

Moreover every day we routinely salvage vital organs from dead bodies and transplant them in the living. If we can salvage the heart or liver of a dead person, how long before we salvage the brain?

So long as you do not lose your head you can travel to the future. The brain contains your intelligence - memory - personality - identity. You are your brain. Never mind the body. You can have a new improved body when you reenter years from now. (More on this in chapter “Replaceable Bodies.”)

These bodies cannot last forever anyway. In the coming years we will design bodies more intelligent and durable and lovely than a human body.

Briefly freezing procedures at present are as follows: the patient’s temperature is lowered while cool chemical solutions are circulated throughout the body. The temperature is lowered some more and the body is then transferred to a cryocapsule or large thermostat where the temperature is maintained at negative 196 degrees centigrade for long-term preservation.

At liquid nitrogen temperatures a body can be preserved for millions of years free of chemical or cellular damage. All biological activity is suspended.

“We have had 100 percent improvement in freezing procedures in the last several years,” reports Jerry Leaf of ALCOR Life Extension Foundation. “In the coming years we will see more improvements: computer monitor for more accurate freezing and warming. Advanced analytical systems for thermal analysis equipment. Better emergency telecommunication and transportation.”

“Suddenly cryonics has become a hot topic, and its future looks brighter than ever,” writes Dr. Paul Segall, biologist at the University of California at Berkeley and long-time researcher in cryonics.

“Tomorrow, mobile units, either vans or helicopters equipped with portable high-pressure oxygen chambers and computercontrolled bypass circuits to provide rapid, oxygenated, and chilled perfusions, will rush to the deathbed. Blood substitutes containing highly effective cold-protecting molecules will defend tissues against freezing damage to a far greater extent than is possible today. New methods of solid state storage, such as vitrification, may be available. Medical-imaging apparatuses, with the aid of a contrast medium ... will detect the areas of the body that have not been adequately cryoprotected and these will then be selectively perfused. As cryonics progresses to the point where it is fully reversible, it will be increasingly applied before death, rather than afterward.”

Early in the new century microscopic machines implanted in the body will be able to repair damage done by imperfect freezing techniques. Death is taking on a new meaning. Suddenly death is not final.

In recent decades we have transcended many of the “immutable laws of nature.” Time and again we have turned reality upside down. The reversal of death is another of our triumphs over the constraints of nature.

Burial and cremation are old ways of dealing with death - they are primitive and tragic. Once buried or cremated, you are gone forever.

The day will come soon when we will look back horrified that until the final years of the 20th century we still treated the dead as garbage - burying and burning them.

The day will surely come when death-reversal techniques will replace age-old ways of disposal of the dead. People will say: “If only we had placed our parents in cryonic suspension. One day we would have brought them back. Now they are gone forever. Why didn’t we do it?”

In suspension centers there is none of the depressing sense of permanent loss that pervades a funeral parlor.

Resuscitation means having the chance for another life - many more lives if necessary.

In our age of Telemed hook-ups & cell phones - emergency medicine - resuscitation and suspension - there need not be a "hopeless" or "terminal" case.

So long as you can be reached, there is hope.

People who still use terms such as hopeless and terminal suffer from a terminal hardening of the perspective.

From here on the hopeless case is rare. The cures are coming up fast - one after another. If you stay on hold - soon there will be a cure. Or some way out. If you give up you will be gone forever.

In our times death only reflects the level of technological progress. What was considered irreversible yesterday is no longer irreversible. Tomorrow death will be pushed back again. Then again and again - until all the causes of death are removed.

"The law and science which only recently agreed on death's definition after years of debate, are again at odds," reports *The New York Times*.

Death is by no means a closed issue. The nature of death is changing all the time.

Do not listen to anyone who encourages acceptance of death. Plan ahead for death-reversal and immortality.

You only have one life. If you live or stay on hold you have an excellent chance to live forever.

Every day that you are alive you move a step closer to immortality.

MOBILIZING TO PREVENT PERMANENT DEATH

HOW TO MAXIMIZE YOUR CHANCES FOR RESUSCITATION

Always carry a cell phone. No one who is serious about immortality should ever be without one.

Carry an ambulatory monitor. These tiny sensors keep tabs on your heart rate - respiration - brain activity. If your vital body processes begin to reach a dangerous level, the monitoring device will alert you. It may even automatically contact a designated telemed emergency service.

Always carry an automatic tracer-tiny electronic transmitters attached to your clothing that can help rescuers find your exact location.

Join a Lifeline Emergency Service. In an emergency, press the button and help will rush out to your rescue.

If available, wear an Immortality module and join a telemedical network. (This would do away with the need for the above emergency monitors and services.) An Immortality suit and Telemed bring together our fastest telecommunication - telemonitoring - emergency services. (See chapters Immortality Module and Telemedicine.)

Sign up with a cryonics suspension service. You will then make all legal - financial - transportation arrangements for suspension immediately before or after death. If plans are made ahead the freezing has a better chance of being carried out properly.

Establish an Immortality Network. This small private support group should be comprised of people actively interested in mobilizing for immortality. Arrange among yourselves procedures to rush to one another's rescue in case of serious injury - terminal illness or sudden death. Your Immortality Network can be counted on to oversee and expedite rescue operations by resuscitation and/or suspension crews.

Always carry emergency information. Names and telephone numbers of your primary physicians - preferred emergency centers - cryonic suspension service - Immortality Network members. Also medical data and instructions on what you would like done in case of sudden death. Before major trips furnish you exact travel itinerary to your physicians - cryonic service - Immortality Network.

Transmit a **written** statement to your physicians - relatives and support ties stating explicitly that in case of terminal illness or injury or clinical death all emergency measures be continued to save you. (This can serve as a backup to your cryonics documents.)

“If I am in severe pain or depression because of my physical condition I may not exercise sound judgment and may temporarily lose the will to live. Please continue all efforts to save me - regardless of what I request under stress. If rescue efforts fail, do not give up. Place me in suspension. I only have this life. If I lose it I will never have another chance. I want the opportunity to live forever.”

TIME-REENTRY ADAPTATION

How will an individual suspended today adjust to life upon reentry in the future?

Time-reentry adjustment will not be a serious problem for the following reasons:

Anyone suspended in these years will probably not have to wait long for reanimation. In fact the time will come when long-term suspension will make no sense. Death correction will be quick and therefore catch-up will not be a problem.

People are living longer and longer. Therefore many of the reanimates' friends and acquaintances will be around.

More and more people are signing up for cryonic suspension. When they are eventually brought back, they will find other reanimates from their original time-zones.

What if you do not find **any** familiar faces upon reentry? What of it? You will make new friends. Why not start afresh? Isn't this precisely what tens of millions of people now do when they voluntarily move from one part of the planet to another? In our fluid times many of our friendships and associations are not lifelong and continuous anyway.

We humans are remarkably adaptable. In recent decades we have seen entire populations switch eras - from Stone Age to Electronic Age - from the feudal/agrarian world to the industrial and the telespherical. There is no limit to our adaptability.

Entire generations are now **born** into worlds of real-time accelerations. To them and to all of us rapid realignment is the norm. We are not even aware that we are continually resynchronizing.

In the coming decades reanimates may not be the only ones having to readapt. Increasing numbers of people will drop out of our world and start new lives elsewhere in the solar system. Some of these extraterrestrials will come back and may also have to zone in.

In the new century we will learn about Time and Space reentry and devise catch-up skills. For example: rapid updates via onbody computers and audio/visuals - rapid playbacks and overviews via touch-and-enter holospheres

- body-attached or brain-implanted decision-assists - automatic information-transfer procedures and so on. We may also have rapid genetic fine-tuning to help returnees improve their concentration - memory - adaptability - learn/unlearn.

Finally in the coming years and decades the world will grow more and more open and friendly. This very day we are outgrowing age-old

adversarial barriers: tribalism - racism - classism - sexism - ageism - nationalism. The freeflow of people across the planet is speeding up. My projection is that a person suspended in the coming years and reentering decades later will at first have more problems with the relative friendliness and openness of the new century than with anything else.

In our times death need not be final. In suspension centers there is none of the tragic sense of permanent loss that pervades a funeral parlor.

Thanatologists and others encourage us to accept death. They tell us that death is **{STS}**“an inseparable part of living. Death can be a positive experience. Die the good death.**{CCH}**”

Thanatologists have gone so far as to assert that the imminence of death actually helps people grow.

Did I hear this right - death helps people grow?

Thanks for the opportunity - but no thanks. Don**{PU2}**’t do us such favors. I don**{PU2}**’t want to carry my growth that far. Who wants to be a very mature corpse?

T - MINUS 11 AND COUNTING

EXTENDING LIFE EXPECTANCY: LIFESTYLE CHANGES

{STS}“This is the age of aging ... A unique demographic shift is taking place. Global life expectancy will continue to rise ... The aging of nations is a triumph - a sign that hunger and disease are in retreat ... The most dramatic increase will occur in Asia and Africa.**{CCH}**”

William Kerrigan - U.N. Conference on Aging - Vienna.

{STS}“The United States has achieved the most dramatic decline in national death rate since the discovery of penicillin. Infectious diseases are no longer the major cause of death... The leading causes of illness and death are those relating to lifestyles... We must shift from traditional preoccupation with crisis health-care to prevention.**{CCH}**”

Dr. Peter Bourne - Formerly Special Assistant for Health to the President.

{STS}“I think we are very close. We**{PU2}**’re at the point of discovering how to utilize the energy of the immune system ... With a health lifestyle we**{PU2}**’re going to be able to push one hundred for sure and maybe beyond, within this decade**{CCH}**”

Dr. Allan Goldstein - Chairman Biochemistry Department, George Washington Medical School.

“The fear of dying early has been replaced by the fear of living too long.”

Insurance advertisement in *Business Week*.

Not long ago people everywhere hoped to live to the ripe old age of fifty or sixty. Today millions are in their eighties and nineties.

Everywhere on the planet people are living longer and longer. Everywhere life expectancy is higher than ever.

In the 1950s life expectancy at birth in many Asian and African nations was around thirty-five. In 1990 it was around sixtyfive.

“A very old man or woman was uncommon in India in the past. Now legions of them,” reports *The New York Times*.

The average life expectancy in the United States has jumped more than fifty percent in the 20th century. The number of people over seventy-five has increased ten times. The number of those over eighty-five has mushroomed seventeen times.

In 18th century America, only twenty percent of the people reached seventy years. Today over eighty percent live beyond seven decades.

The main reasons for the rapid rise in life expectancy everywhere are improvements in living conditions and lifestyles: better nutrition - better hygiene - improved medical care - less smoking - less hardship - fewer serious diseases - fewer children - more exercise - more leisure and recreation - better attitudes to life - more opportunities for continuous emotional and intellectual growth.

Most of these improvements are in areas over which the individual has control.

Yet too many people still die in their twenties - thirties - forties - fifties - sixties - seventies. They are not benefitting from the life expectancy revolution.

The leading causes of death in many societies are heart disease - cancer - stroke - accidents - chronic pulmonary disease - atherosclerosis. These causes of death are brought about largely by self-destructive habits.

The following measures for prolongation of life have been thoroughly discussed in medical and health studies. I include them here briefly as a reminder.

Nutrition

The following are suggestions that health specialists generally agree on:

Eat less and live longer. Avoid obesity.

Don't skip meals. The hungrier you are the more you are likely to overeat. Fasting is not a safe or effective way of losing weight.

Eat slowly. Focus on your food. Don't eat while engaging in vigorous dialogue or watching television or reading. (We eat partly to satisfy **emotional** hunger. If you don't focus on your food you will not be emotionally satisfied and will soon crave food again.)

Substitute vegetables for meat and fish. Vegetables - fresh fruits - nuts - whole grain cereals are known as "protective foods." They protect people from serious diseases. High meat intake has been shown to lead to heart disease - strokes - certain cancers - loss of calcium - high cholesterol - high blood pressure - accelerated loss of kidney function.

"Vegetarians are less likely to be afflicted with the chronic diseases that are leading killers in societies where meat is the centerpiece of the diet," reports Jane Brody in *The New York Times*.

Exercise

Regular exercise enhances metabolic processes - stimulates flexibility and muscle strength and reflexes - improves circulation and lung capacity - reverses loss of bone and muscle tissue - strengthens joints - allays severity of arthritis - stimulates sexuality - keeps weight down - helps manage stress and tension.

(Regular exercise has been shown to dramatically reverse the effects of aging even in sickly ninety year olds.)

Mental Stimulation

The brain no less than the body needs continuous stimulation to grow.

"Using your brain stimulates your dendrites. That in turn, we believe, will slow down some of the age-related loss," says Dr. Arnold Scheibel - UCLA neuroscientist. "If we keep challenging our mental and emotional capacities - learn a new skill, study a new subject, take up tennis, fall in love - we have a much better chance of staying younger longer. It is possible for an eighty-year-old to have a thirty-year-old brain."

Numerous surveys have shown that people who enjoy continuous intellectual stimulation gain in memory and reasoning - adaptability - concentration - decisiveness - mental alertness.

Your brain power - use it or lose it.

Stress-handling

Chronic stress can lead to general ill-health.

The National Mental Health Association suggests the following steps to help relieve stress:

Talk it out. When something worries you, don't bottle it up.

Escape for a while. When things go wrong, it helps to escape from the painful problem for a while.

Work off your anger. Do something constructive with the pent-up energy. Pitch into some physical activity or work it out in tennis or a long walk.

Give in occasionally. Even if you're right, it's easier on your system to give in once in a while.

Do something for others. If you feel yourself worrying about yourself all the time, try doing something for somebody else.

Take one thing at a time. Take a few of the most urgent tasks and pitch into them, one at a time, setting aside all the rest for the time being.

Shun the "superman" urge. No one can be perfect in everything.

Go easy with your criticism. Each person has his own virtues, his own shortcomings, his own values, his own right to develop as an individual.

Give the other fellow a break. When you give the other fellow a break, you very often make things easier for yourself.

Make yourself available. Instead of shrinking away and withdrawing, it is much healthier, as well as more practical, to continue to make some of the overtures instead of always waiting to be asked.

Schedule your recreation. Many people drive themselves so hard that they allow themselves too little time for recreation - an essential for good physical and mental health.

I will add the following: It is not necessary to fight every battle or struggle to resolve every conflict. "Most battles are not worth waging." I believe it was Sigmund Freud who said this.

Ask yourself: How will waging this stressful battle affect my total life situation? How will it advance my greater goal of living forever?

What will you gain if you win a thousand fleeing battles but lose the only prize that really counts - your life?

Smoking

"No single measure would lengthen your life or improve your health more than eliminating cigarette smoking" cautions the U.S. Surgeon

General. Smoking has been directly linked to lung cancer - heart attacks - circulatory problems - impaired memory - premature aging and death. Smokers want to kill themselves. Do not smoke.

Alcohol

Heavy drinking precipitates cirrhosis of the liver - certain cancers - loss of coordination resulting in increased susceptibility to accidents and violence.

Drink in moderation or not at all.

For older people there are now therapies that can slow down and even reverse some of the debilities of old age. For example: human growth hormones that stimulate the body to develop muscle. Testosterone - the male sex hormone - and estrogen can help men and women stay youthful and stimulate sex drive. Blood cell growth hormones can encourage the production of white blood cells and keep ninety year olds healthy and resilient.

“I am very hopeful,” says Dr. Evan Hadley - chief of the geriatrics branch of the National Institute on Aging. “There is a real possibility of significantly reducing the problems of physical frailty in old age over the next decade.”

These lifestyle modifications can help extend life. They are all within our control.

These measures will not insure immortality. For the young they offer protection from early death. For older people they are stop-gap measures to prolong life by twenty or thirty years.

Twenty or thirty years? That’s nothing. Why should I cut out meat or cigarettes simply to live an extra couple of decades?

At one time an extra twenty years may not have made a difference. In our times even a few years could be everything - the difference between permanent death and permanent life.

Don’t say I didn’t warn you! Remember: from here on in it is all a matter of gaining time.

T - MINUS 10 AND COUNTING

SLOWDOWN OF BIOLOGICAL AGING

“The aging puzzle will be essentially solved by the year 2000 or even sooner. It may then be possible to add considerably to human lifespan. Some day we may be able to live almost indefinitely.”

Dr. Bernard Strehler - Professor of Biology, University of Southern California

“We are on the verge of finding a way to eliminate senility, thus facilitating a human lifespan of 200 years.”

Dr. James Bonner - Professor of Biology - Cal Tech

“Advances in biology will soon give us ... the power to live indefinitely.”

Dr. Robert L. Sinsheimer - Chairman - Biology Dept. - Cal Tech.

Everywhere in the world **life expectancy** is increasing. But people still age. The human **lifespan** has not budged. People do not live beyond 115 years. That still remains the ceiling for our species.

Improvements in lifestyle and disease-control extend life expectancy but not maximum lifespan. To break through the lifespan barrier we have to slow down the biological process of aging.

This is a complex task. We do not even know the basic causes of aging. Why do we age at all?

Do we age because of damage to the DNA? Or do we age because our cells accumulate waste products of metabolism? Is aging accelerated because our immune system deteriorates rendering us increasingly vulnerable to disease and death?

Is aging mainly a result of free radical invasion? In other words do we simply rust as our cells are increasingly exposed to some forms of oxygen and other free radicals? Is aging due to some dysfunction in the hypothalamus region of the brain - the master gland of homeostasis? Do we age because of any of these factors? Or because of a combination of these causes? Or is it none of the above?

We do not know. Most researchers believe that aging is due to many causes. There is not yet a universally accepted theory of aging.

What matters is that vigorous research in senescence is proceeding on many fronts. Things are not at a stand-still.

“It is said that we have to understand the mysteries of life before we can do anything about it. This just isn't so,” says Dr. Roy Wolford Chief of Geriatrics Division - UCLA Medical Center and author of *Maximum Lifespan*. “Jenner introduced small pox vaccine years before

anyone knew anything about immunity. We^{PUB}ll certainly increase lifespan long before we understand the mysteries of life.

^{STS}“Even now there are a lot of things around that work to a certain extent: genetics to stimulate DNA repair. Compounds to bind free radicals. Co-enzyme Q which acts on the mitochondria. Treatment with pituitary hormones. All of these have proved to extend average lifespan somewhat.^{CCH}”

Of the current situation in aging research Wolford explains: ^{STS}“It is characteristic of science that a group of highly differing theories precede a major synthesis. Aging research is in that state now. We are on the verge of a major synthesis, but where it is coming from no one can predict right now.

^{STS}“I am optimistic that one, or more, or a combination of these methods will produce good results within the next ten years.^{CCH}”

Never has there been as much effort to unravel the mysteries of aging as there is today. In numerous research centers around the planet we are waging a massive assault on aging.

Gerontology and geriatrics are two of the fastest growing areas of medicine. The extension of human life is growing into a lucrative enterprise.

Governments are also jumping on this evolutionary bandwagon. For example the government of the Soviet Union has sponsored a ^{STS}“Prolongation of Life^{CCH}” program under the auspices of the Academy of Sciences.

In the 1970's the Congress of the United States created the National Institute on Aging ^{STS}“to focus on the causes and problems of aging.^{CCH}”

^{STS}“By far our greatest effort is related to obtaining a better understanding of the aging process^{CCH}” explains Dr. Richard C. Greulich - Scientific Director of the National Institute of Aging and Director of its Gerontology Research Center in Baltimore. ^{STS}“This effort should inevitably produce some major advances leading to technologies that will substantially increase average life expectancy and perhaps affect a significant extension of the human lifespan as well.^{CCH}”

Here are some of the developments that lend support to the growing conviction that we will in the near future control the basic processes of human aging thereby significantly extending lifespan.

Information in the biological sciences and in aging research is currently doubling every few years (mainly due to new superfast gene machines and analyzers).

Increasing success in the actual control of some of the processes of aging. For example - prolonging - even doubling - the maximum lifespan of laboratory animals (mainly through caloric restriction).

Increasing use of computer models of mammalian physiology that test and quantify different mechanisms of aging.

Rapid advance in the multi-billion dollar Genome project which with the help of supercomputers is helping us map and sequence all the genes in our cells. This monumental effort will one day soon help us identify the causes of inherited diseases and aging.

Rapid advance in brain research via imaging and scanning technology - brain mapping - telemonitoring - electrical stimulation techniques. We may not be far from developing drugs and grafts and other procedures to treat Alzheimer's disease.

Boost to biological experiments and drug manufacture (electrophoresis) in the new zero-G earth-orbit.

Growing public demand for control of aging as more and more millions live beyond eighty and ninety and one hundred years.

The reversal of aging is not the focus of this book. More and more books and articles on the prolongation of human lifespan are coming on line.

But what if we do not succeed in arresting the aging process in the near future?

If we can't stop biological aging - the hell with it. We will go around it. We will replace all aging parts of our bodies with more advanced substitutes. As I will attempt to show in this book we will take even more radical measures that will make aging a total non-issue.

The fact is that even when we succeed in controlling the mechanisms of aging that will still not help us overcome our basic vulnerability to death - accidental death. A lifespan of a thousand years can still be forfeited in a second.

We need to do much more to rendez-vous with immortality.

T - MINUS 9 AND COUNTING

TELEMEDICINE

“Thousands of people die needlessly each year because of inadequate emergency medical services... More than half of 700,000 heart-attack victims die before reaching a hospital... Emergency services represent one of the weakest links in the delivery of health care in the nation.”

The National Academy of Sciences, Washington, D.C.

This “weak link” is in the U.S.A. - the nation with some of the world’s most advanced medical and telecommunication and transportation systems. How must it be in areas of our planet with less developed technology?

It makes no sense that at a time when we have early-warning systems - home monitoring devices - portable telephones - everyone still walks around unmonitored and unprotected - vulnerable to creeping diseases and sudden fatal injuries.

How illogical that we wait until a person is dying in an intensive care unit of a hospital before we deploy our remote telemonitoring.

How outrageous that we who can pick up signals from our spacecraft at the edge of the solar system billions of kilometers away still have no rapid-alerts to pick up malfunction signals from inside our own bodies or cries from a distressed person only a kilometer away.

How sad that people should still die because help arrived just a few minutes too late. A few minutes too late. In our times a few minutes can make the difference between permanent death and ongoing life.

Every year around the world millions of lives could be saved if everyone’s body processes were at all times telemonitored to provide instant alert on imminent diseases and critical injuries.

At one time the idea of a telephone or a two-way computer linking the home with the outside world was considered futuristic. The day will come soon when not just every home - but every individual - will carry in and on the body tiny electronic devices for instant telecommunication and continuous telemedical protection.

What exactly is telemedicine and how can it help protect us from internal and external threats to our safety?

Teled is the interface of medicine and telecommunication. It is the stage beyond centralized - bureaucratized - stationary hospitals.

In telemed the physician the hospital the laboratory the pharmacy are all within you - wherever you are. Prevention and protection are continuous. Your vulnerability to disease and injury and sudden death is significantly reduced.

Telemed performs the following services:

First. It provides each individual with continuous day/night monitoring of physiological functions and instant tie-in with emergency services. In case of an imminent malfunction (such as a heart attack) telemed automatically alerts you - sometimes before you yourself are aware of a coming problem.

Telemed is the stage beyond the age-old pattern of waiting for disease to strike then rushing in to treat.

Medicine treats diseases. Telemed prevents them.

Second. Telemed automatically regulates - stabilizes - stimulates physiological processes. It also automatically controls pain and administers medication. All this is done without having to run to a doctor or a hospital.

Third. In case of serious injury (as in an accident) telemed rushes the emergency service to **you** - wherever **you** are. Such a service is particularly valuable in our times when people are mobile as never before and therefore not always near a hospital.

Telemed is a natural outgrowth of our decentralized interactive new world of telespheres. The technology for telemed is here - home monitors and feedback devices - stimulators and drug delivery implants - onbody telephones - automatic dialers - data banks.

Telemed is already deployed in bits and parts in home care and emergency cases. However there is not yet a general application of **all** these tele-technologies for **all** people. such a universal application would constitute a giant forward leap in the protection of each human life.

Telemed by itself will not do away with disease nor will it avert injury or phase-out death. But it will help prevent some diseases and in speeding up treatment of all illnesses and injuries it will save millions of lives every year.

Telemed is a powerful assist in our reach for Immortality.

T - MINUS 8 AND COUNTING

IMMORTALITY MODULE - HIGH TECH CLOTHING

 “In the future clothing may not only protect you from the environment, but regulate the micro-environment next to your skin.” 
Lawrence Kuznetz, bioengineer for NASA

Who are the most smartly-dressed people in the world? The supersonic set? The bicoastals? The transglobals? The superaffluent? The tele-stars? The hyper fluid?

Guess again. The best-dressed people in the world are actually out of this world. We wear out new fancy electronic Lifegear only when we go visiting away from this world.

We are already treating our old planet like a ghetto. Why get dressed up here on earth?

Here on our home-planet we still go around dressed in primitive clothing. We wear essentially the same rags we wore as Neanderthals thousands of years ago.

Why have our garments not kept up with our other ingenious technology? Clothing is also technology - yet we still wear animal skins on our backs as though nothing has evolved.

Why do we still wear these backwater garb that hardly protect us from anything? Why do we still go around needlessly exposed to all kinds of dangers?

Millions of lives could be saved each year if we put on intelligent gear to protect us from the elements - from collisions and crashes - from violent crimes and from countless other threats to our safety.

During these countdown decades we can enhance our chances for immortality by discarding our passive know-nothing clothes and zippering up in friendly apparel that can do things for us.

The garment industry fritters away billions of dollars replicating redundancies year and year. Dress designers have not come up with a fresh idea in thousands of years. We have allowed the wrong people to design our clothes. We should now let the engineers take over.

Our Space Agencies have already devised intelligent interactive clothing for people who get off the planet. These new outfits have fancy names:

Extravehicular Mobility Unit (EMU). Ejection Escape Suit. Anti-Gravity Suit. Environmental Control Life Support Suit. Biological Isolation Garment and so on.

These and other life support suits have been engineered to help stabilize body temperature and protect the wearer from fire and solar radiation and micrometeorites and from other hazards in trans solar Space.

Isn't it ridiculous that we create ingenious garments to protect ourselves from cosmic shrapnel in Space but do not come up with anything to protect ourselves from environmental and societal assaults that maim and terminate countless human lives every day right here on Planet Three?

All the component parts of high-tech protective garb are here: Super fibers (‘‘miracle fibers’’) - interface peripherals - intelligent micro-tech - teled linkups. All we have to do is put them together and come up with a new recombinant outfit - an Immortality Module.

The Module is a new concept in clothing. Not just a new style or a new fashion - but a radical disconnect from age-old concepts of clothing.

The Immortality Module is a year-round genderless computerized outfit. It is zip-fronted for swift suit up/suit out. Made of miracle fibers such as PBI Rayon and Kevlar it is stronger than steel yet lighter than fiberglass.

The Immortality Module interacts with you and with your surroundings. It protects you - responds to your needs - aligns your moods - dialogues with you - alters your environment. It is an intelligent friend. This high performance gear combines high-fashion with hightech for high-orbit living. This is a 21st Century look.

The Immortality Module protects you in three major ways:

First: It protects you from imminent malfunctions within your body.

Second: It protects you from some external threats.

Third: It enhances the chances for safe suspension in case of sudden death.

Wear your Module when bicycling - driving - flying - traveling or when entering even a medium-risk environment.

For maximum safety wear your Lifegear often - you cannot foretell when you might get caught in a fire an earthquake a storm an auto collision a mugging - or a sudden heart attack.

In our age of beckoning immortality beating out death is the great challenge. The new freedom and security that the Module offers is exhilarating.

Dance in the bitter cold or in the sizzling heat protected in your temperature-controlled capsule.

Walk away from a collision a crash a fire a holdup with minimum injury. Switch on your Vision Amplifier and scan the environment far and wide.

All this helps us feel more secure than ever that our lives are not likely to be suddenly ambushed by some sly disease or a dead-serious accident.

The Immortality Module may offer yet another benefit. A body kept at a constant comfortable temperature and shielded from sunlight - wind - pollutants - dust and weather fluctuations may in fact age more slowly than if exposed to the elements.

T - MINUS 7 AND COUNTING

FREEFLY

“Robots that fly - we already have them. We call them airplanes.”
Charles Lecht

“Levitation is not just the strangest but also one of the most practical prospects raised by superconducting materials. Floating trains (Maglevs), floating furniture, floating people - otherwise sober scientists are talking about applications that used to belong to the realm of science fiction.”

James Gleick - *The New York Times*

“You could put on a pair of special shoes (for levitation) and make little tracks along which you could push yourself and keep going. Nothing to stop you.”

Praveen Chaudhari - Vice President for Science at the I.B.M. Corp.

How often through the eons we have all dreamed of flying - sailing through the air free and fluid. Flying for the joy of flying.

How often we have desperately wished we could miraculously fly away from a disaster. If only I could fly away from these rampaging floods. If only I could somehow fly off this sinking ship. If only I had wings to fly out of the window and escape this terrible fire. If I could somehow get to a hospital right away my life would be saved.

Why can't I fly? Why can't I fly?

Today for the first time we can actually fly. Just strap on a small backpack and you can fly off your window. Take off from anywhere - land anywhere. (One day we will not even need a backpack.)

We began the 20th century unable to fly. Today we are flying all over the place.

In recent decades aviation has had a powerful impact on all areas of human life. In the coming years and decades freefly (via individual vertical lift systems and backpacks and levitation) will have even more profound impact - reconfiguring our social rhythms our concepts of habitation - community ~~and~~ communication, eventually our physiologies.

What is the relevance of freefly to immortality?

In the short-run freefly helps save lives and reduce the threats to our safety.

In the long-run freefly will help us evolve from grounded bipedal organisms to new airborne beings.

Currently we freefly via helicopters and jet packs. You don't have to be a Jules Verne to see where all this is leading to in the coming decades.

In the years ahead millions will freefly via helicopter-like craft and back-mounted lift devices - the latter propelled by solar cells or microwave.

A little later we will levitate using superconductors. (Thousands of us in zero-gravity environments will even levitate **without** superconductors.) Still later we may incorporate freefly capability into our new high tech bodies. We will no longer be bipedal.

Does all this sound implausible? Remember that airplanes and helicopters were also dismissed as implausible early in the 20th Century.

“Flight by machines heavier than air is unpractical, if not utterly impossible” predicted the astronomer Simon Newcomb in 1902.

Just as a hundred years ago people had difficulty accepting the automobile and the airplane - today people resist the next dimension in mobility - individual freefly.

The development of vertical lift vehicles (VLVs) and jet packs and levitation (personal maglevs) are slowed down mainly due to lack of funds - while we continue to fritter away huge sums of money on obsolete transportation.

Why do we still dissipate billions of dollars on highway construction and maintenance? This is highway robbery. Automobiles - buses - subways - motorcycles - these are the horse and buggies of our times.

Isn't it dumb that at a time when helicopters and more advanced vertical lift commuters can whisk us across a vast city in just

15 minutes we still insist on marinating in fourwheel buggies traveling at 10 K.P.H. in congested streets?

How tragic that at a time when we have helicopters tens of thousands of people still perish in accidents simply because they are not reached in time.

“Hospital-operated helicopters manned by trained nurses and physicians and dispatched to accident scenes can increase the survival of badly injured victims by fifty-two percent.” according to the University of California San Diego Medical Center.

Such rapid deployment of emergency care is saving lives every day. We urgently need more and more vertical lift ambulances. In fact **all** ambulances should be airborne. Ground ambulances no longer make sense - certainly not in our times of spread-out communities and high-mobility.

“Model system for the delivery of trauma care has been established in (West) Germany ... Most patients are transported to designated trauma centers by helicopters ... 90 percent of the population is now within 15 minutes of a trauma center.”

We need a new dimension in transportation - smart versatile systems that not only facilitate rapid mobility - but also expand our personal range and quickness of movement.

We need instant fly-away capability to reduce our vulnerability to dangers and enhance our everyday safety.

Where is the safest place in a fire or in an earthquake or in an imminent personal assault? In the air! In case of a threat simply fly away. Just fly away.

The more grounded we are the more exposed to injury and death.

We now have new lift devices that can give us such quick fly-away versatility.

What about the safety of freefly?

Helicopters and more advanced vertical lift commuters are safe mainly because they can land just about anywhere. The helicopter for example is one of the safest transportation systems around - though it is used extensively in hazardous rescue operations.

If the engine stalls in mid-flight you can resort to “autorotation” - release the blades by disengaging the drive train. Air pressure will then

force the blades to turn breaking the helicopter's fall and giving you some control.

"Helicopter safety records are better than those of most other aspects of aviation" reports Fedor Drnovsek - aviation analyst at Golightly and Company.

The new generation of VLVs such as the "Sky Car" and the "Sky Commuter" have many additional safety features: automated navigation - collision-avoidance systems and - most important - high-powered emergency parachutes that can be deployed in a couple of seconds. In case of a serious malfunction your flying vehicle parachutes down safely - "like an open umbrella".

People who jet-pack around should also be required to carry these new instant parachutes for extra safety.

All freefliers should be required to wear Immortality Modules and helmets. We now require motorcyclists and automobile racers to wear helmets - why not fliers?

Here is a long-range additional safety plan. When individual freefly becomes popular we could begin to transform our freeways into flyways. (Just as at one time we converted our stagecoach trails into auto routes.) We can cover these flyways with some cushioning substance such as foam or rubber or some other resilient material and require people to fly over them. In case your vertical lift craft or jet-pack malfunctions and your emergency parachute does not deploy your fall will be cushioned. At worst you may be slightly injured or just shaken up. You will just get up and walk way - or fly away.

The flyway may not always be the most direct way between two points - but this is a small price to pay for extra safety. Flyways could also help regulate freefly traffic. Obviously you won't need to use the flyway if you are floating only a short distance - say from your liftoff point to a nearby friend's lawn.

Several decades from now we may not even need flyways because we ourselves will be airborne and accident-free. We will levitate with total freedom and never fear anything.

T - MINUS 6 AND COUNTING
INTELLIGENT ENVIRONMENTS

“The intelligence in some Boeing devices exceeds that of any professor at the University of Washington. And their humanitarian consideration ... the ability to worry about whether the person is landing safely ... A 747 is not only a robot, it’s a robot that goes through stages. It becomes a cyborg - part human and part machine.”

Charles Lecht - Lecht Sciences, Inc.

“Completely automated homes ... living walls - soft and warm, walls with fingers to massage you after a hard day, with ears to listen to your complaints and with a voice to soothe your spirits.”

Earl Joseph - Sperry Univac

To evolve into immortal beings we have to overcome our vulnerability to **all** external dangers. To this end we have to advance in at least two major fronts.

1. Transform our primate bodies into intelligent modular forms. (See chapters ahead.)
2. Transform our unpredictable environments into intelligent protective surroundings.

The farther back we go in history the more unpredictable were our environments and therefore the more exposed we were to ever present dangers.

The more we advance into the future the more monitored our worlds grow and therefore the more predictable and managed the hazards.

How do we make our surroundings safe?

We do so by giving them eyes and ears and sniffers and voices to warn us of dangers and accommodate our needs.

We help our environments to help us. We give them whatever it takes to make them friendly.

A mud village that collapses in a mild tremor killing all its inhabitants or is washed away in a flood or is attacked by predators is a “dumb” habitat. It does not monitor the world around it and is therefore at the mercy of deadly hazards.

A modern shopping center or - better still - a Space station is a relatively smart milieu. In such an environment few things are left to chance. Numerous microprocessors continually monitor the inner and outer surroundings anticipating conditions ahead and warning of possible dangers and malfunctions.

Monitors and scanners and other electronic sensors reinforce our limited biological senses to expand our visual - acoustic olfactory - tactile and interactive ranges.

Extensions of our senses and brains are everywhere and growing more and more sophisticated. These environmental  "eyes and ears 

 are enabling us to see and hear faster and farther and deeper and clearer than ever.

We are not only able to anticipate conditions ahead (predict) we are actually able to see and examine things in new ways. We can playback a situation or a report over and over for scrutiny. We can slow-motion - frame-freeze - flash-back - fast-forward - reduce - magnify - detail-down - overview - forward-context and simulate.

All these mechanisms enable us to see the worlds around us with greater clarity and intelligence.

Bit by bit we are introducing more and more intelligence to our environments making them smarter and therefore safer.

Still our surroundings - even our smartest premises - are fraught with dangers.

From mid-21st century perspective our communities today - even our most modern mediums - are recklessly under-monitored and therefore everyday people are critically injured and lose their lives.

There Are Four Major Categories of External Threats To Our Safety.

1. Natural Disasters:

Storms-tornadoes-hurricanes-floods-landslides-tidal waves - earthquakes - volcanic eruptions - heat and cold waves.

Every year an estimated one million people perish in natural disasters. The more backward the area, the greater the fatalities. The better monitored the region, the fewer the deaths.

It is not a coincidence that the heaviest death tolls caused by natural disasters are in rural and backward regions of the world.

2. Environmental accidents:

Drownings-fires and burns-falls-poisonings, etc. Every year several hundred thousand people die as a result of environmental accidents.

3. Vehicular accidents:

Fatalities caused by automobiles-trains-boats-airplanes.

In the United States alone around 50,000 people lose their lives in automobile accidents every year. The number of such fatalities (in proportion to population) is greater in most other countries.

4. Violence:

Murders-gang wars-bombings-uprisings assassinations - armed conflicts. Every year more people die of these external threats than die of disease.

Among people under forty years of age, injuries and accidents alone are the number one killers.

External threats to life do not recognize age or gender or genes. They can bring down anyone - young and old - healthy and sickly - rich and poor.

Our vulnerability to surrounding hazards is largely determined by our level of preparedness.

More than 250,000 people died in 1976 when a 7.8 magnitude earthquake devastated Tangshan, China. In 1985 a quake of similar magnitude hit near Valparaiso, Chile where one million people live. Only 150 people died.

The main difference: Construction of buildings. In 1985 a volcanic eruption killed 20,000 people in rural communities of Columbia. The more ferocious Mount Saint Helens eruption in Washington in 1980 killed fifty-seven people.

The main difference: Early warning and evacuation.

Floods in Bangladesh have wiped out entire villages drowning thousands of people. Massive floods in North America have inundated entire towns and farmlands with hardly **any** fatalities.

The main difference: Better construction of houses - advanced warning - rapid evacuation.

(There are areas in North America where  "there have not been any surprise snowstorms in years. " The accuracy rate of weather prediction in modern societies is now close to ninety percent.)

Thanks to better safety measures - early warning systems - smoke detectors and fire alarms - rapid rescue operations (including helicopter ambulances) more and more people are rescued from fires and drownings and other environmental accidents.

Thanks to better highways - more safety regulations - advanced air traffic control - smart electronics in new cars and trains and planes - fast

rescue - the number of fatalities from transportation accidents continue to drop in proportion to the spectacular rise in global mobility.

Thanks to improved telecommunication - emergency medicine - resuscitation measures - more and more victims of crimes are saved from death.

Still millions of people everywhere on our planet perish every year as a result of disasters and accidents and violence. Millions of others are maimed and injured and left homeless.

Safety measures will not eliminate external dangers. They will steadily lower the level of unpredictability in our environments and enhance everyone's safety.

Every day we are creating smarter and smarter machines. These smart systems go on to create yet smarter machines at an ever accelerating pace. The transition from one level of intelligence to the next is speeding up as machines themselves participate in devising more and more complex intelligence.

How can we mobilize all this intelligence to help us create safe environments?

1. To maximize our safety we need to upgrade the level of intelligence in **all** areas of our lives.

What good is flying in an ultra-intelligent supersonic aircraft if you then have to drive home in a semi-moronic automobile that blunders into a terrible collision on an unautomated freeway?

As machines grow smarter they grow more versatile and we must hasten to incorporate them into more and more areas of our lives.

We must graft intelligence to our clothing - our consumer goods - our home and work and play and school environments - our transportation and roads - our buildings and garages - our stores and restaurants and all public and private places.

All areas of our lives must be made intelligent (safe).

2. As our planet grows more interconnected our safety in any location will depend on security conditions everywhere.

To create an intelligent house we need an intelligent neighborhood. To have an intelligent neighborhood we need an intelligent city. An intelligent city needs an intelligent region or continent. An intelligent continent needs an intelligent planet.

You cannot ensure your safety in your home or office building if there are no central security computers somewhere in your city continuously processing information issuing from your home or office.

You can no longer be safe anywhere on the planet if the aircraft you fly in does not have continuous access to local weather reports or if a nuclear power plant anywhere does not have proper safety mechanisms or if there are no modern medical services in some [STS]“remote [CCH]” place you happen to be visiting when you are stricken.

To have a safe neighborhood we now need a safe planet - because the entire planet is now our neighborhood.

3. As our machines grow smarter they also get smaller. We must incorporate these microscopic units into our most primary environment - our bodies.

Our goal for the years ahead should be to create environments and bodies so smart that hardly anything will threaten us.

In the coming years our environment will grow more and more intelligent and therefore safer. We will hardly be aware of this steady upgrade - just as today we are hardly aware that our modern computer-operated surroundings are smarter and safer than ever.

T - MINUS 5 AND COUNTING RECONSTRUCTED BODIES

[STS]“There [PU2]’s no reason why anyone should have to look old. [CCH]” Dr. William Keavy - New York plastic surgeon.

Seeing yourself age reinforces your resignation to aging and death. [STS]“I am growing older [CCH]” - you whisper in your head as you look in the mirror. [STS]“I have a tired faded look. I am moving closer to death - there is no way out. I have to accept the inevitable. [CCH]”

Cosmetic surgery will not stop aging. It can slow down the resignation to aging. Looking healthy and great at any age can lend support to the forces of life within you. It can help you trick psychological aging until a time when we will do away with aging altogether.

A sixty-eight year old woman sits in front of a computerized video system. The plastic surgeon uses a magnetic pen to edit the images on the screen. [STS]“This is how you looked at sixty from different angles, [CCH]” the surgeon says.

[STS]“That [PU2]’s right, [CCH]” she murmurs, staring at the screen.

“Now let’s see how you looked at fifty. This is how your face can be redesigned to look today.”

“It is still not young enough.” “Let us see what happens if we take off another few years. You now look twenty or thirty years younger. Is this the look you want? Or should we try for an entirely new look?”

You can now go in for plastic surgery and come out transformed from head to toe.

You can have a new redesigned face and a reconstructed body. You can be made attractive or remade to look young. You can be redone to look very nearly any way you want to look.

For example, women striving for success in their corporate environments have their faces redesigned to look less vulnerable - more assertive. Men with aggressive features are remade to look softer.

Reconstructive and cosmetic measures are increasingly ambitious and daring. They are for the most part painless and the results often long-lasting.

Most of the surgical procedures currently performed are for esthetic (cosmetic) reasons - for example restructuring the nose or mouth. Others are to correct inherited abnormalities or disfigurement brought on by injury or disease - for example correcting cleft palates or reattaching fingers.

3-D imaging is increasingly deployed for precise mapping of the inner structure of the face or body. Computer graphics are then used for high-resolution alignment and beautification.

“Why not accept the fact that you have a large nose and a receding chin?” People said at one time. “This is the way you were born. There is nothing you can do about it.”

Today plastic surgeons routinely reshape noses - straighten out buck teeth - correct gummy smiles - enlarge receding chins - create new breasts - redo misshapen testicles.

“You may be able to redo your nose and correct your protruding ears,” people said more recently. “But you can never get away from your ethnic and national look. It is all in your facial features. Why not accept your origins. You can never change your basic features.”

Never? Today plastic surgeons all over the world routinely redesign national and ethnic features. Japanese - Koreans - Chinese are resculpted

to look Caucasian. Caucasians in North America and Northern Europe go in for a Mediterranean or Latin look. Latins adopt “Anglo” looks.

“People may have some of their features altered but they can never change more basic features like the color of their skin or their height. Never? Will skeptics never learn?”

As life expectancy lengthens more and more people also want to reverse the signs of aging. Face lifts - forehead and brow and lip lifts - chin and jaw augmentations or reductions - smoothed out wrinkles from the face and neck - these and other procedures help rejuvenate an aging face.

A sagging body can be resculpted to look young with the help of liposuction - tummy tucks - breast and thigh lifts - implants in aging hands and buttocks and calves.

Sixty year old women and men with the reconstructed faces and bodies of forty year olds is no longer uncommon.

Turn on your television set any day or night and you will see glamorous **youthful** people in their fifties and sixties and seventies.

In the coming years reconstructive and cosmetic procedures will continue to grow more sophisticated and ambitious and will even go beyond plastic surgery. Here are some of the advances we can expect:

Physiological alterations will be made before birth by introducing specific DNA information into sex cells and through intra-uterine interventions.

Banks will store people's tissues - bones - skin to be used later - as needed.

Laser therapy and osteoinduction will be performed to regenerate and rejuvenate tissues - bones - worn-down organs.

Reconstruction and cosmetic procedures will be increasingly non-invasive (bypassing surgery). For example skin aging and sagging will be prevented and/or erased with genetically-designed pills and ointments and transdermal techniques. “Rejuvenation drugs will be custom-tailored” says Dr. I. Kelman Cohen - Chairman of Plastic Surgery at Medical College of Virginia. “We’ll know so much about the cells’ enzyme systems that we’ll be able to control fat.”

Genetic engineering will reinforce plastic surgery. When we learn more about our genes - their specific functions and locations - we will manipulate them to perform extensive physiological and anatomical

alterations: alter height - change skin pigmentation - restructure the basic shapes of the head and body.

Plastic surgery cannot help us grow younger. It can help us look younger - or better still it can help us look good at any age - and therefore reinforce our will to live.

In the decades ahead rejuvenation and regeneration procedures will be so accessible and commonplace that one day an old tired look may be a rarity.

One day no one will **look** old. One day no one will **be** old.

What a paradox. As a rule we grow more confident and youthful as we grow older. We grow **younger** as we **look** older.

Through the marvels of plastic surgery we can now **look** as youthful as we feel.

A fifty year old can be magically redone to have the freshness of a younger face without losing the more interesting look of an older person.

What will we be able to do in ten years? In twenty years? In thirty years?

How soon before we are able to routinely align a hundred year-old's body and face to match a vigorous spirit?

T- MINUS 4 AND COUNTING

MODULAR BODIES

"We are well on the way to being able to replace virtually every organ and bone in the body with (man-made) substitutes. The era of the bionic person - where engineering and biology meet - is no longer science fiction but science fact."

Donald E. O'Neill, Vice President of Warner Lambert Co.

If we can go on trading in failing parts indefinitely, the death rate will dwindle away to nothing ... Immortality may eventually become a purchasable product."

David Rorvik - *As Man Becomes Machine*

Millions of people are alive today because we are taking liberties with our primal bodies -replacing diseased and aged parts with modern substitutes.

As people live longer and longer we will need more and more replacement parts for tired organs.

Bioengineering is one of the fastest growing areas in medicine. Body engineers are developing ingenious parts for the human physiology:

implants - explants - electronic senses - smart limbs - monitors and much else.

Replacement parts are made of silicon - polymers and plastics - rubber - dacron - metals - fiberglass - combinations of alloys and materials. Even screws and wires and washers are used - anything that will work and is non-toxic and non-reacting.

We are replacing bits and chunks of the human body - from the largest organ (the skin) to some of the smallest (the nerves).

If you cannot repair it - replace it. This is the revolutionary spirit that impels bioengineers.

If your joints or hips or knees creek and rattle and cause you pain - get rid of them. We ll give you brand new parts that will enable you to ski again.

If you have severe problems with your arteries or muscles or blood and nothing can be done to remedy the glitch - don't  give up - we now have substitutes.

We even have penile prostheses (erectiles) for the impotent. Press a button for instant erection. (The early erectiles sometimes malfunctioned. Some men could not persuade their overachieving appendages to calm down. One seventy year old man had a sixweek perpetual erection. First he couldn't  get it up - after the operation he couldn't  get it down.)

If your vital organs do not perform well and threaten your life - no need to roll over and die. We now have transplants for all major organs. But a transplant is an interim measure. More durable implants are on their way. We already have mechanisms that temporarily take over the functions of major organs.

The heart-lung machine stands in for the heart during surgery. The oxygenator substitutes for the lungs. The dialyzer does the work of the kidney. You don't  need remote scanners to see where all this is going. Where there is a portable - an implantable is sure to follow.

If a limb of yours is amputated you can now go shopping for a new limb from a wide range of choices - some of which may even be smarter than your own limbs.

If your senses shut down - hope is not lost. Advances in bioengineering are helping more and more blind to see - more and more deaf to hear - more and more mute to speak.

By treating everything in our bodies as throwaway and replaceable we are forever changing our attitudes to the mystique of the human body. Replacing your heart or lung or leg is no longer a setback. You have only lost a part of your past. Welcome to the future.

If your body deploys synthetic parts do not think of yourself as handicapped. People with replacement parts have high-tech bodies - they are in the vanguard of shapes to come. They are transhumans. If we want to be around for a long time we will all have to upgrade our bodies.

Does this mean we will have to give up all our body parts? Don't panic. You can hold on to any part of your body to which you are particularly attached.

At present we only want to replace those parts that have broken down of disease or injury or wear-and-tear.

But soon sophisticated replacement parts will allow our bodies capabilities never before enjoyed by biological organisms.

Superpowered arms able to lift enormous weights. Modular hands with adjustable fingers able to elongate - refract - vibrate - remote-sense. High powered rocket legs able to take giant leaps - skim on land or water - go for days without tiring. Synthetic hearts designed to beat forever.

Little wonder that scientists at MIT and elsewhere who are now creating a new generation of intelligent prostheses are besieged by people wanting to trade in their own normal limbs for the more advanced superlimbs.

We need a new perception of the term "handicapped." Who are the handicapped in our times - those with perpetual hearts and tireless high-tech limbs or those with the old fragile parts?

Next time you meet a person with an implanted synthetic organ or an electronic limb - remember you are not looking at a handicapped person - you are actually seeing a transhuman - a forerunner of ultra-smart beings who will pervade the 21st century.

Suddenly the human body is changing. What we see emerging is a new kind of body - a modular transbiological form - comprised not only of flesh and bone and blood - but also of silicon and polymers and fiberglass.

Bit by bit we are redoing the human physiology.

Each time we learn to replace a defective organ or devise a new monitoring implant we reduce the threats to our safety.

Each time we create a new prosthesis we move a little closer to the creation of an intelligent body - we grow a little less animal, a little less human, a little more transhuman.

Each new replacement part, each new modification of the body is a step toward immortality.

Advantages of Synthetic Prostheses Over Biological Transplants

Why do we have to wait for people to die so we can strip them of their parts? People are not sacrificial animals to be stripped and shared: we  'll take the eyes - you take the kidneys - they can take the balls. We should work toward safeguarding each and every human life.

Transplants will not always be available. In the coming years life expectancy will continue to rise and human mortality will continue to drop. More and more of the dead will be brought back. More and more people will ask to be placed in cryonic suspension. Where will we find organs for transplants?

Prostheses, unlike transplants, can be produced in unlimited quantity.  "Please send over three model 6A hearts and five LT livers. 

If a synthetic part malfunctions the wearer is not likely to feel pain. For example a smart limb has no nerves. If it is crushed in an accident you feel no pain and no other part of your body is affected. You simply replace the damaged limb.

Prostheses can be made adaptable to different environments on this planet and beyond. Some people 's joints become arthritic under damp conditions - silastic joints have never heard of arthritis.

Improvements in synthetics are far more rapid than in organic parts.  "The rate of evolution of machines is million times faster because we can combine separate improvements directly where nature depends upon fortuitous recombination 

 notes Marvin Minsky of MIT. For example human limbs have hardly improved in a few million years whereas prosthetic limbs have undergone rapid improvements - from peg legs and wooden hands to mechanical limbs to myoelectric limbs to smart computer controlled limbs. And we are just beginning.

The animal/human body is a highly centralized system with interdependent parts. The ovary stops functioning if the pituitary does not stimulate it with hormone. Anxiety can bring on headache - stomach cramps - sexual dysfunction

- constipation. The development of prostheses is a step toward the eventual creation of a modular body with decentralized parts.

Finally the human biological structure has intrinsic limitations which cannot be indefinitely upgraded. There is a limit to how much you can improve the vital organs, the senses, the limbs. So long as they are flesh-and-blood they have built-in limitations. Prostheses have no limits. We can go on refining them indefinitely. We can use new materials - alter their sizes - shapes - functions. We can make them sturdy enough to last for hundreds of years.

In our times of replaceable parts and rejuvenation age has less and less meaning. We are transbiological - born and reborn and recombined and repackaged. We have many ages.

“How old are you?”

“How old am I? How old am I where? Some parts of me were born in 1940. My heart and lungs are six years old. My intestines were installed two years ago. I am getting a brand new hip next month. I recently underwent a total body reconstruction.”

Early in the 21st century we will make more radical changes and it will be even more difficult to quantify age. We will be chronologically fluid. We will be ageless.

T - MINUS 3 AND COUNTING STREAMLINED BODIES

I am no longer simply my body.

This body is a vestigial part of me.

The organs the flesh the limbs the bones the liquid - all are increasingly irrelevant to my future.

They are part of my animal past.

At one time indispensable to my survival - they are now a deterrent to accelerating evolution.

Up-Wingers

In recent decades we have dared to ask revolutionary questions about the human body. Why die if your vital organs have stopped functioning? Why not replacements for malfunctioning body parts?

Today millions of people are alive because we dared to question the biological status quo.

In the coming years we will ask even more daring questions. Why do we need any internal organs at all? Why not streamline the crowded

insides of our bodies by removing more and more of our organs?

Why do we need bones and joints? Why blood and veins and arteries? Why do we need any vital organs? How vital are they? Why kidneys? Why a liver? Why the heart? Why the pancreas?

What does the appendix do for us besides being a pain in the gut?

Why the intestines? Sheep have intestines. Pigs and rats and hyenas have intestines. Why do we have to carry sacs of rotting garbage inside our bodies?

Over 60 percent of the human body is water. Why do we walk around perpetually carrying so much liquid? What a heavy load to carry around a lifetime. What a waste of energy. What a drag. No wonder we are always tired and wear out quickly.

What is all this junk doing inside our bodies?

Why am I at the mercy of a pea-sized piece of tissue called the pituitary? To hell with the pituitary. To hell with the ventricles the alveoli the jejunum ... To hell with the whole troublesome lot of them.

Why do we hold on to these relics of our jungle days? How absurd that we live a lifetime with numerous organs that we never get to see.

How absurd that such a promising phenomenon as human life with all our potential for infinite growth should still be at the mercy of a liver or a heart - a blob **of flesh**.

Why allow these perishable bits and pieces of flesh and bone to slow down our potential for explosive growth? How do these animal parts make us happy? How do they define who we are and who we are evolving into? Why then settle for replacement parts? Replacements for what - organs that are themselves obsolete?

The most intelligent prostheses are finally nothing more than replacements for functions that are intrinsically useless.

Implants and transplants are no longer enough. We have to go beyond substitution. We have to make more fundamental changes.

The human body is overbureaucratized - full of superfluties and obsolescences.

In our age of microminiaturization why carry so much heavy equipment? At a time when a small high-powered computer can operate a telefactory why walk around with such overload?

In 1950 a computer was the size of a giant hall. By the 1990s a computer with far greater memory and computing power was the size of a

book. During this interval the size of the human body remained the same.

By discarding our excess baggage and allowing a few intelligent microcircuitries to take over we can enhance our efficiency and durability.

The streamlining of the human body picked up momentum in the second half of the 20th century. This very day we are removing more and more organs without replacing them.

What are some of the disposable parts? Tonsils - appendixes - fallopian tubes - ovaries - wombs - lymphatic glands - gallbladders - spleens - aortas.

We also remove colons - pancreases - kidneys - large intestines - parts of small intestines and stomachs - parts of livers and bowels and rectums - parts of lungs - parts of jaws - parts of brains.

Brains? Yes, we are removing parts of the brain without losing anything - except deadly disabilities.

I repeat: we now surgically take out these parts and do not replace them with anything.

What we are saying is very clear: we can now function splendidly without many of our organs.

But why stop there? Why not use computer simulations of our physiological functions to see how the body freed of more and more internal organs will perform? Three-dimensional computer models of the human body have already been developed.

Here are a few suggestions for streamlining our internal parts:

Why the digestive system?

The long and complex process of digestion starts with the chewing of food followed by swallowing then the elaborate processes of churning the food first in the stomach then in the small intestine then in the large intestine then absorption by blood and lymph followed many hours later by peristalsis and eventually elimination.

We still sustain our bodies the way we did millions of years ago when as primates we roamed the plains. Today even the most primitive robots draw energy more efficiently.

Most of the elaborate organs and pipelines in the body serve to process energy (nutrition). Once we develop a more sophisticated energy system most of our internal parts will be unnecessary.

After all why salivary glands - pharynx - esophagus - when we no longer need to swallow? Why stomach - spleen - intestines - liver -

gallbladder, etc. when we no longer have to digest anything? Why any of the organs of elimination when there is nothing to eliminate?

If there is no food to process why have blood? (The respiratory - regulatory - non-nutritive functions of blood can also be taken over by a new simplified process.) If there is no need for blood then why the heart why veins and vessels and arteries?

A body freed of these internal components will be light and streamlined - its energy needs enormously reduced. The brain will have implants each with its own self-contained energizer. We will have to develop a way of delivering oxygen directly to the organic parts of the brain-bypassing nutrition and breathing. Such a mechanism should not be difficult to devise.

Years ago D.B. Cole the visionary physicist and aerospace engineer wrote:

“It should be within the capability of the medical engineers of the 21st century to...close the nutrient-waste cycle within the body such that no material would enter or leave. The gaseous, liquid, and solid wastes of the body would be reconverted to oxygen and fuel while other wastes would be reconverted into needed structural materials ... An energy supply would be required to run this closed-cycle chemical machine and this would also be carried within the body.”

What kind of energy supply? He suggested a rechargeable compact fuel cell or a miniaturized fusion power device. He noted that one pound of hydrogen could theoretically supply a person with energy to last for 50,000 years.

Dr. Michael Del Duca - formerly of NASA - thought along these same lines: we will eventually learn to convert sunlight directly into energy within our bodies. This sort of photosynthetic cyborg will not need any food at all and will be free to spend its “entire life” exploring Space

...
Isn't it time we outgrew the crude process of stuffing grub into our mouths to sustain ourselves? Is there finally a difference between a hyena that tears into the flesh of a prey and the human who sits all dressed up at an elegant banquet tearing into dead flesh that has been cooked and garnished to cover up the blood?

Ask people to give up an arm or a leg or even an ear - but don't ask them to give up food. They will growl like angry animals.

But think of it this way: until now we have had to eat in order to live for a few decades. Now we can go beyond eating to streamline our bodies and live forever. Not a bad exchange.

In outgrowing the primitive process of feeding our bodies we also free ourselves of all the afflictions brought on by our alimentary apparatus: painful liver and kidney malfunctions - ulcers - intestinal disorders - stomach cramps - constipation - diarrhea - hemorrhoids - obesity, etc.

Why fritter away time and resources producing - distributing - consuming food stuff? We have more important things to do. For one thing we want to explore our universe. We cannot streak across the galaxy schlepping along grocery bags.

Why reproductive organs?

Why do we still walk around like cows carrying embryos inside our bodies?

How ironic that we inventive beings who have created robots that can replicate themselves in just a few hours still go through months of pregnancy the way we did millions of years ago when we were on all fours.

Why do we still have ovaries - testicles - tubes - pouches - sacs - eggs?

Eggs? Hens lay eggs.

Why do we put up with the many glitches connected to reproduction? Why monthly menstrual cramps? Why persistent depression and mood swings due to hormonal imbalances? Why the agonies of sterility and impotence? Why the pains and uncertainties of childbearing and delivery? What a painful inefficient way to reproduce new life.

Little wonder that the most liberated woman and men on our planet now refuse to procreate. For these millions of people the reproductive organs have already become superfluous.

Ova and sperm banks - embryo banks - insemination - adoptive pregnancies - embryo transfer - in vitro fertilization - these and other existing procedures are steps in the inevitable direction of post-biological replication of life.

In the coming years we will reproduce entirely in vitro and perhaps via in vitro cloning. Stored sex (and body) cells will be screened and the best features of various donor cells will be cross-fertilized for gestation in safe synthetic wombs.

The point is that we will completely bypass our reproductive organs. We may not even need the physiological mechanisms to produce ova and sperm because we could freeze-store millions of these sex and body cells to be used as needed.

Then too in the 21st century the perpetuation of our species will be ensured less and less through reproduction and more and more through regeneration of each existing life. Each and every life will be considered precious and worth safeguarding.

What about the ecstasies of sexuality?

We certainly do not soon want to give up the delectations of sexuality - pleasures that do not even stand in the way of streamlining our bodies. We want to hold on to our genitals.

In fact freed of our troublesome reproductive organs we will engage our genitals only for pleasure. We will enjoy sexuality with total freedom.

Free at last of the survival need to imprint and mate and parent we will for the first time enjoy love-making without fear and guilt without possessiveness and jealousy.

Later in the 21st century as sexuality continues to lose its procreative function and gender distinctions phase-out, lovemaking may lose its ecstatic element. New activities at higher levels of life will spawn new kinds of ecstasy.

In the coming decades we will probably attempt to streamline our anatomies in other ways as well. We will accomplish this through techniques which will have matured by then: computer modeling - manipulation of chromosomes and genes - advanced reconstructive measures - implantation of highly versatile microcircuitries.

For esthetic reasons we may decide to keep some of our **external** parts - such as our arms and legs. In time our esthetics will change and we will probably make extensive external remodelings as well.

As we jettison more and more of our **internal** organs our bodies may evolve into sleek ultralight structures. In time to come the body weight of an average six-foot transhuman may be around thirty-five kilograms (around eighty pounds).

Such an ultralight body will not need much of a skeletal framework. Bones and joints and tendons will not operate efficiently within our high-powered 21st century bodies and environments. Even young sturdy bones are too fragile for extensive freely and extraterrestrial life.

We may develop versatile frameworks for our physiologies - replacing bones with strong synthetic alloys. We are actually doing this in bits and parts right now.

Today's synthetic skins will inevitably lead to new kinds of skins: durable - tear-proof - fire-resistant - buoyant. The new skins may be transparent for esthetic reasons as well as for quick access to the body's microcircuitries.

Our messy convoluted insides will give way to tiny regulators - monitors - energizers.

New fields of biostreamlining will inevitably arise. In fact bioengineers and surgeons are this very day laying the groundwork for the eventual overhaul of our internal parts.

The streamlined body is the minimum upgrade needed if we are to operate efficiently in the transglobal and transsolar life ahead. Above all the streamlined body is another important step in our efforts to live forever.

T - MINUS 2 AND COUNTING REPLACEABLE BODIES

"The body is just something to carry the brain around in." Thomas Edison

"I want to be a machine." Andy Warhol

"I have no loyalty to DNA." Hans Moravec

"All biology is technology.

We as individuals represent a most complex technology. Anything that operates under cosmic laws is technology. The universe is nothing but technology."

Buckminster Fuller

"Human life is too precious - too full of fantastic potentials to be at the mercy of the primitive body ... This body so programmed so alone and unfree so susceptible to pain and violence - so fragile."

Up-Wingers

Once we transfer our brains to accident-resistant replaceable bodies we will have surmounted one of the major obstacles to absolute immortality.

The brain weighs around three pounds and can sit in the palm of the hand. Protecting the brain is relatively easy. Even ensuring its immortality will turn out to be surprisingly uncomplicated.

It is the body that renders us all - old and young alike - particularly vulnerable. The body is the large part of us and is crowded with major and minor organs all interconnected and perishable. It is more difficult to protect the body from aging and accidental death.

Most of the problems of our "aging" brain are preventable and treatable - if the complicating problems of the aging body were removed.

Around five percent of the people over 65 years of age suffer from serious mental deterioration such as Alzheimer's. In the coming years we will prevent and treat senile dementia and related disorders.

Countless surveys have shown that as a rule people **feel** much younger than their chronological years. Most people do not view themselves as old. Those who do not suffer from serious disabilities generally grow more self-confident and feisty as they move forward in life.

"The aged brain does not deteriorate" notes Dr. Marshall Gash of the University of Rochester. "The aged brain is far more flexible than we give it credit for."

Professor Marian Diamond - pioneering brain researcher at the University of California at Berkeley - reports that nerve cell loss in the brain is not a problem - as previously suspected - because the brain has more cells than it will ever need.

She has also demonstrated that "an aging brain is not necessarily a declining brain - that, on the contrary, in an enhanced environment, the brain cells may actually be enlarged with age."

"Intellectual decline in old age is largely a myth. In many areas such as information storage, many people even show improvement with age." report Paul Benites and Warren Schaic - University of Southern California psychologists.

"I don't feel old at all - except for arthritis in my leg and deafness" declared Hamilton Fish - former U.S. Congressman - at the age of 95. "My mind is as good as it ever was and I speak as well as I ever did. I know more than I have ever known."

Irving Berlin the composer - asked about his health at the age of one hundred - replied "My health is wonderful - from the neck up."

In the early 1970s Richard Meyer a writer-activist in his eighties was a valuable participant in our seminars on the future at The New School for Social Research in New York City. "My mind is young," he once told

us. “I am more daring and optimistic than ever in my life. I believe in the future. My mind races forward. But this body of mine is old. My body is falling apart. I have many aches and pains. What can you do about my body?”

As we grow older our bodies begin to malfunction. Respiratory problems - tired organs - fragile bones - weakened legs often curtail our freedom of movement. Our sight and hearing begin to fade. Many older people are on medication which often has side effects such as constant drowsiness and blurred memory.

The combination of these and other factors gradually leads to loss of mental alertness - depression - loss of a will to live. Eventually the body short-circuits the brain.

If accidents do not destroy our bodies wear and tear eventually will.

Just as things begin to fall into place - just as we come to terms with ourselves and gain the confidence to enjoy life - our bodies begin to fall apart.

Why allow our mortal bodies to sabotage our minds - these minds so full of desperate longings for immortality?

Why does a vigorous dynamic mind have to die simply because the animal/human body cannot go on?

Our primate bodies have not significantly changed in several million years. Only parts of our brains have evolved. Our bodies are still in the jungle. Our minds soar among the stars. Millions of years separate the two.

Our minds have grown too sophisticated for these bodies. Our primate bodies can no longer keep up with our expectations and restless visions.

We cannot significantly improve the basic quality of human life so long as we do not improve the basic quality of the body.

We urgently need to do something about the body.

Why not create entirely new frames that can keep up with our increasingly intelligent brains? Why just replace parts of the body? Why not replace the entire body?

Attempts to liberate the head from the prison-cell of the body began in earnest in the second half of the 20th century.

In the 1950s the Soviet surgeon Vladimir Demikhov transplanted the top half of a dog to the body of another dog. Russian scientists have also experimented with cat brains decoupled from their bodies.

In the 1960s Dr. Robert White of Cleveland Metropolitan General Hospital began a series of extraordinary neurosurgical operations. He disconnected monkey heads from their bodies and kept the heads alive. He also transplanted brains from one monkey to another and transferred heads of primates to other primate bodies.

These stand-alone heads stayed alive for a while – able to see - hear - smell and react to stimuli.

“Technically a human head transplant is possible,” the ingenious Dr. White has said. “There is no doubt that we can isolate a human brain as we isolate a monkey’s brain. All that we need to make it live is plain ordinary blood ... I know that today we could keep Einstein’s brain alive and make it function normally.”

“I am not sure that the brain needs the body, except to be supported ... When I detach the brain from the body that intelligence and that personality remain intact. It is true that the brain uses the body as an instrument for learning, but what he has learned doesn’t get lost with the loss of the body. His imagination remains and his memory and his ability to associate ideas.”

“Life in a person comes from the mysterious organ that encloses the mind. It is all there in that ball of jelly. I can cut off your arms, your legs, your tongue ... I can change your kidneys and lungs, I can replace your heart - and you basically remain the same individual. But if I take your brain, nothing remains of you.”

Alluding to people who resist the idea of brain-body decouple Dr. White said: “We are locked in traditions, often in the most despicable hypocrisy. One prefers to know that his relative’s brain is dying in the ground rather than know it is living (without the body).”

In a recent interview with the *Chicago Sun-Times* Dr. White noted that he has repeatedly performed head transplant operations on primates and that his surgical team is ready to extend this work to humans. **“We could develop all the instruments and procedures necessary to perform a head transplant in less than a year.”**

D.M. Cole also projected the eventual link-out of the head and body. He envisioned the emergence of “saucer men” - people whose heads have been transferred to transparent saucer-shaped capsules and who “have become practically ageless and indestructible. They can move

about on gravity or electromagnetic force fields and can send out light, radio, or acoustic signals to activate machines ... {PU1}'Saucers{PU2}' could have any experience they desired (such as pleasures) by simply sending the correct taped signals into their brains ... In fact these experiences can be made more intense than normal by turning up the power.

{STS}'Progress toward the {PU1}'saucers{PU2}' is accelerating rapidly. Some people will be transformed into {PU1}'saucers{PU2}' because their own organs wear out. Others may be {PU1}'remade{PU2}' for special assignments since the {PU1}'saucers{PU2}' could move about at high speed through the atmosphere, under water, in space, on other planets, through fire and radiation and could withstand enormous acceleration.{ECH}'

We are now taking other steps toward freeing the all important head (brain) from the limitations of our outdated bodies. We are performing human brain grafts - brain tissue transplants - partial brain excisions - hemispherectomies (removal of an entire hemisphere) - memory transfers from one animal to another (via RNA injections).

We are also storing more and more of our memories in electronic brains such as computers and data banks and expert systems. We also have stand-alone heads in cryonic suspension. When these people are reanimated they will need new bodies.

Yet another step in this inevitable direction is the development of computerized androids that replicate in exact detail the physiologies and faces and voices and mannerisms of specific persons - for example U.S. presidents at Disney Worlds.

Advanced androids have also been created for medical and dental schools to replicate the human physiology and body functions. When used by medical students these smart androids with computerized inner organs sweat and bleed and urinate and suffer heart attacks.

Companion robots and sexual androids are now being developed and will soon be in the market.

It is only a matter of years before we begin transplanting the head or brain of a terminally ill or injured person to a standby body. This will be a total body prosthesis.

Once we break free of orthodox flesh-and-blood physiologies we will design any kind of body we wish. Any form any shape any size any color any molecular composition.

We will not be bound to replicate the human body. What is so special about the human structure and shape? Why not create entirely new models far superior to our age-old anatomy?

The intelligent standby body will not need digestive - urinary - respiratory - reproductive - circulatory - skeletal - muscular systems. This new body will not be a biomedical structure. Instead of entrails and intestines and bowels the high-tech body will need sophisticated telesensory parts such as scanners - trackers gyroscopes - infrared viewers. These are the electronic ST“organs CH” that will render us viable in the rapid smart environments ahead.

Communication - not food - will be our nourishment in the 21st century.

Nerves alert us of threats to our safety by registering pain. But pain is a primitive biological mechanism for signaling danger. Pain is too heavy a price to pay for protection.

Electronic sensors are more effective alerts and cause no pain.

One of the central assets of the new body is that it is painfree.

What should we use for skin? Obviously something less vulnerable than our epidermis. At first we may use a synthetic skin that has the feel of our own muscle tissue yet is more durable and does not easily burn or tear or puncture. We may experiment with polymers or anti-rubber or carbon-reinforced plastic.

Microscopic computers implanted in such a ST“skin CH” can help it adjust to radical temperature changes and alert us if the threat to the pain-free body is intolerable.

As we grow more daring we will develop ST“skins CH” that will change colors and designs and may have windows for quick access to the interiors of the body.

The telebody could be designed to look human. But such a bipedal limb-propelled model will hardly make sense in our thought-activation freefly environments on earth and beyond.

Arms and legs - valuable in the early stages of our evolution - will have less and less utility in the new century.

Arms and legs were for crawling and climbing trees. In the fast-response electronic environments ahead nearly all the functions we have performed with our limbs will be taken over by remote-control systems such as vision/voice/thought-activation. A coded thought in the brain - a

swift verbal command - an explicit glance - any of these will effortlessly accomplish most chores we now do with our hands.

The 21st century environment itself will be formatted to accommodate these and other advances.

An aerodynamic limbless 21st century body will be far more versatile than the most agile 20th century human.

As we grow more and more airborne legs will eventually lose their locomotive functions. Once we adjust to freefly we will never regress to walking or running. Why legs? Legs just hang uselessly in the air during freefly. They are not aerodynamic. They are also brittle - not suitable for constant liftoffs and landings.

We may for a while keep our arms and legs for esthetic reasons and for hugging and loving. (This may turn out to be a massive single-track projection.)

We may design saucer-shaped bodies as suggested by D.M. Cole and others. Such a form is aerodynamic - able to fly at all speeds with minimum drag. With these new bodies we can hover on land - float on water - park in the air - soar in the stratosphere - flash across the sky at sublight speeds.

We may design other forms and shapes.

Bioengineers - reconstructive surgeons and others now use computer modeling to repair and rejuvenate and beautify the human figure. Why not use computer graphics and simulation to test different kinds of bodies and come up with intelligent designs?

Why not speed up this inevitable process so we can rescue all the people who this very day are at the mercy of phase-out bodies?

Let us begin now to design modular bodies that can easily alter shape - size - form - color to operate compatibly in different environments.

Let us hurry up and devise bodies that are more than simply vehicles to carry the head. Intelligent frames that reinforce - even extend - the brain's intelligence. Bodies with supersenses that continuously monitor the environment far and wide anticipating conditions ahead.

Let us begin now to design bodies so intelligent and protective that no fire will burn us no cold will freeze us no fall or crash or collision will maim us no bullet or knife will finish us no stranglehold will shut us down no body of water will drown us no avalanche or earthquake will entomb us

no poisons or radiation will do us in. Bodies that will significantly reduce our vulnerability to all external threats.

Let us design intelligent bodies that never fall ill - are never surprised by sudden heart attacks or other breakdowns. Bodies that never know pain - fatigue - hunger - thirst - sleepiness.

Let us create forms able to wing in and out of different time zones - orbits - planets and never experience desynchronization.

Let us hasten to produce bodies that can easily be disconnected and replaced. Bodies that never cause us to age or to die.

Let us hurry up and devise marvelous new bodies that can liberate us from our animal past. Intelligent secure bodies that will enable us to be who we have long aspired to be. Bodies that can at last set us Free.

Why does a vibrant mind have to die simply because the fragile body has broken down?

T - MINUS 1 AND COUNTING

DURABLE BRAINS

 "Most of your brain is devoted to making you act like a monkey. 

Lozano-Perez - Professor of Computer Science - MIT

 "In order to produce a machine that thinks better than man we don't  have to understand everything about man. We still don't  understand feathers, but we can fly. 

Edward Fredkin - Professor of Computer Science - MIT

 "It is difficult to try to responsibly convey some sense of excitement about what 's going on (in brain research)...You try to be conservative and not say wild things, but damn! The field is wild and intriguing... 

Professor John Liebeskind - UCLA

Brain is matter and matter can be replicated.

To ensure our immortality we have to find ways to ensure the immortality of our brains.

The brain contains the most precious parts of us - our intelligence - memory - personality - identity.

You are your brain.

How then do we make sure that our brains do not die? I will start with the obvious: It is unlikely that we could keep a flesh-and-blood brain alive

and functioning and growing for hundreds of years. Flesh-and-blood organs do not last very long - not even in ideal environments.

We cannot be immortal in our perishable brains.

To ensure our immortality we have to relocate to nonbiological brains.

How do we do this?

Following are three ways that appear promising at present. (Other measures will probably come on line in the future.)

1. Bioengineers have been implanting tiny devices in the human brain: pacemakers - monitors - stimulators - regulators - transceivers.

These battery-powered electrodes are conductors of electricity. They are placed deep inside the brain or just outside the skull. Their insertion in the brain is painless.

Brain implants perform a variety of functions such as the management of chronic pain - depression - epilepsy - impotence - motor activity malfunctions.

There is no limit to the range of such applications. [STB] "We (may) implant an entire molecular computer in the brain to monitor body functions and signal problems. [CCH]" predicts James McAlear of EMV Associates in Rockville - Maryland.

Forest Carter of the U.S. Naval Research Laboratory believes that [STB] "A computer with molecular gates should be able to duplicate that computational power of one thousand Crays within the space of a cubic centimeter. [CCH]" (Crays are powerful supercomputers.)

[STB] "Once we learn enough about the hardwiring of the brain to figure out the patch cords [CCH]" he predicts [STB] "those thousand Crays within a sugar cube could be implanted within the head or neck of a person to provide a stunning booster to the brain.

[STB] "You know this work can be done because you have a molecular computer inside your head and down your spinal cord. The really interesting thing is that we could make a molecular computer a hundred times more dense than the human brain - easily. [CCH]"

K. Eric Drexler of MIT foresees even more microscopic robots [STB] "complete with on-board computer - propulsion system - and robotic arm - the entire thing the size of a bacterium. [CCH]" These nanosized robots could be inserted inside our cells to monitor the body [PUB]'s vital functions - to repair damaged organs - even to create new organs.

The point is that as we introduce ever tinier microscopic peripherals into our brains - somewhere along there will be a blurring of organic and electronic brain activity. It will be increasingly difficult to distinguish between the two overlapping parts.

It will be difficult for example to tell whether a certain piece of information or an idea has issued from the animal/human part of the brain or from the electronic graft. Just as today it is difficult to tell how much of their seizures epileptics manage on their own and how much is regulated by their implants. Or what parts of computations we make issue from our own brains and what parts from the personal computer we are plugged into.

Gradually the impact of these new brain-assists will show up in our every day lives: Better management of our emotions - better monitoring of our body functions - expanded memory banks - instant direct tie-in to other brains - improved problem-avoidance capabilities - reactivation of parts of brains that have shut down.

If  "most of our brain is devoted to making us act like monkeys 

 these smart implants will help us act more like humans.

Implants could gradually take over more and more functions of our brains. For example why not store new information in the more durable and versatile brain implants? Why not allow tiny electronic monitors to take over from the organic parts that control hormones and body temperature and monitor activity and pleasure centers?

In time all our brain functions could be replaced with implants. Such a synthetic brain will be immortal because its component parts will be renewable and forever replaceable.

2. Another way to ensure the immortality of the brain is to streamline it. Researchers have found that our gray matter - like our body - is full of redundancies.

 "A tiny bit of gray matter may be all we need 

 suggests Dr. John Lorber - a pioneering neurologist at Sheffield University in England.

 "My recent investigation of large numbers of children and adults in England who suffer from hydrocephalus - an excess of cerebrospinal fluid within the skull - has demonstrated the existence of (such) reserves. Despite the excess fluid - which sometimes reduces the cerebral cortex to a thin rim at the periphery - many of these patients manage to maintain normal intelligence.

“This suggests that as in the case of the kidneys and liver, the brain has a tremendous amount of spare capacity, located either within the reduced volume of the cerebral hemisphere, or perhaps deep within the older parts of the brain.

“It appears that the brain has greater plasticity than was previously thought possible, and that functions normally carried out in the hemispheres may be relocated elsewhere in the brain.”

This plasticity has recently been borne out by successful hemispherectomies - surgery that **removes** a diseased hemisphere of the brain. A stroke or a tumor or even an inborn abnormality can precipitate a seizure disorder affecting only one hemisphere of the brain. When such a neurological malfunction becomes intractable the diseased hemisphere is surgically removed.

“The closest science can come to a synonym for such “miracles” (hemispherectomies) is “plasticity” - a phenomenon by which certain neurological functions can migrate from one hemisphere to the other” reports Nancy Shulins (Associated Press) in the *Los Angeles Times*.

“Parents of hemispherectomy patients report no dramatic changes in personality following surgery, with one exception: the children are happier.

“How can a surgeon remove half the human brain, yet excise none of the human spirit?...How can half of the brain be lost without any discernible loss of its byproducts - generosity, humor, insight, optimism? How can a human being with half a brain still worry, plan, invent, imagine, reason?”

When we gain a deeper understanding of the complexities of the human brain we may find easy ways of streamlining it - excising parts of it to reduce its size without losing any of its necessary functions.

As I noted in the chapter “The Streamlined Body” we now routinely jettison more and more parts of our bodies without impairing ourselves. Why not do the same with our brains?

We have already isolated and transferred parts of the brain (memory - learning - agility - sexual behavior) from one animal to another. Brain cell transplants in humans show great promise.

“Within five to ten years, it may be possible to use transplants to cope with brain damage due to aging, Parkinson’s, etc.” says Dr.

Donald Gash of the University of Rochester.

If some brain cells are now transferred why not other brain cells? Why not isolate and safeguard specific vital parts of the brain?

Imagine a tiny bit of tissue - perhaps a few ounces - containing all the complexity of a normal brain.

Such a small piece of tissue will be easier to protect and transfer than a four pound brain. A compact brain will need very little oxygen.

In other words by reducing the size of the brain we will reduce its exposedness. We will better protect it until a time when we can transfer its contents to a more durable synthetic vehicle.

If during these transitional decades to immortality a person is in phase-out with no prospect of rescue - then we could remove the tiny crucial parts of the brain and keep them alive.

There may come a time when each of us may want to have our brain streamlined - for greater protection and easier transference to new bodies.

One day we may even be able to insert a propulsion mechanism in such a tiny brain - like the microscopic selfpropelling robots envisioned by scientists today. Then theoretically such a microbrain will have the capability to decouple from the body whenever the body is in mortal danger or crushed in an accident or entombed in a pile of rubble. The powerful (little) brain could burrow its way out and set itself free.

3. Yet a third way toward immortality of the brain is through downloading its contents into a high-tech capsule.

In a way we have been transferring more and more of our selves into synthetic memory banks. We record and immortalize our voices in audiotapes and our images in videotapes and holograms. We encode our professional skills in "expert systems" so others may benefit from them. We deposit our sex cells in ova and sperm banks for possible reproduction in the future.

We even create robot clones and androids that ingeniously replicate our faces and bodies - our voices and mannerisms - down to the smallest detail.

Soon we will even download our exact personality configurations in new systems called "artificial personality" and "personality clones."

In other words we are now able to listen to you - look at you - plug into your live memories and expert skills - reproduce your genes - interact

with you - though you yourself are nowhere around.

Only recently all this would have sounded like exoticisms from the heliosphere.

Now we want to take all this a step further - we want to take the real-time contents of your living brain - your memories - personality - intellect - emotions - and transfer them wholesale to an electronic brain.

In other words we want to relocate you from your perishable flesh-and-blood brain to a more versatile durable vehicle.

How do we do this?

Electroencephalograph (EEG) has long been used by the medical profession to monitor electrical waves in the brain.

Scientists now implant electrodes in the skull of disabled patients to pickup brain waves which are then transmitted to a computer and synthesizer to generate speech.

Communication experts and the military continue to work on  "mind-reading machines 

 to create thought-command systems. Electrodes attached to the scalp pickup specific thoughts (commands) from the brain and transmit them to computers which then help carry out the instructions such as operating a machine or moving some far-away object. Thought-activation is expected to play a major role in 21st century technology.

The fact is that we are developing sensitive devices to read our brain signals. These mind-reading devices are growing more and more sophisticated as they learn to pick up distinct electrical patterns from different areas of our brains.

Eventually we will be able to record the contents of the brain and transfer them to a new receptacle.

Some of us futurists have long forecast the eventual transference of the brain 's contents to more versatile modules. Hans Moravec - the senior research scientist at Carnegie-Mellon - has recently given these projections greater emphasis and definition.

In his book *Mind Children* he suggests several ways to transfer our minds to new bodies. Using advanced technology in an operating room we could download our biologically-based mind

- area after area - to a standby computer. Or using a highresolution brain scan we could -  "in one fell swoop 

 - and without surgery - move you over.

Copies of this brain are then reproduced and stored in various places for safekeeping.

In the *Tomorrow Makers* - Fjermedal wrote that [ST5] “Many researchers seemed to believe downloading would come to pass. The only point of disagreement was when.

[ST5] “Although some of the researchers I spoke with at CarnegieMellon, and later at MIT, Stanford, and in Japan thought that downloading was still generations away, there were others who believed we were actually close to achieving robotic immortality. [CCH]”

These are some of the techniques we know of **currently** that can help us ensure the immortality of our brains.

The three methods outlined here are interconnected. Progress in one procedure is reinforcing advances in the others. For example reading more and more of our brain waves will help us more effectively implant electrodes as well as eventually helping us streamline and download our brain [PU2]’s contents.

We are advancing on all three fronts: We are developing even tinier implants - mapping more and more of our brains - excising more and more parts of our gray matter - transplanting more and more brain cells - creating more and more sophisticated mind-reading machines.

In the coming years these (and other) measures will serve as last-gap efforts to save people from brain-death. Later on we may turn to such procedures to transfer our minds to safe places and avert death altogether. But a synthetic brain is not the original brain - purists will argue. This is not the immortality of the biological you.

True enough. But how can we pull off a light year leap from mortal to immortal and expect to remain unchanged in our personality - intelligence - identity?

The personality and identity of a mortal human can never be the same as the personality and identity of an immortal being.

Emotions central to a mortal individual will be superfluous in an immortal person. [ST5] “Survival emotions [CCH]” will phase-out **anyway** as we evolve beyond survival. A new - profoundly secure and confident - personality and identity will inevitably coalesce around the new brain (the new person).

In the end all that will remain of our original minds - all that we will in fact **want** to salvage - will be strands of memory.

“The brain is my second favorite organ” Woody Allen has said.

If his favorite organ is the one I think he has in mind then he is misplacing his allegiance! The brain is still our sexiest organ - it is the seat of pleasure.

Brain implants are helping us regulate our pleasures and our moods. One day they will enable us to have Free Will and to live far into the future.

It is not nothingness that awaits us, let us make an injustice of it, let us fight against destiny...

Miguel de Unamuno

IMMORTALITY AT LAST

We are in the Age of Immortality. Millions of us alive today will be around forever.

Who will be around and who will not - no one can tell.

We cannot yet guarantee **anyone's** immortality. Anyone can die at any moment. We are all exposed.

The best we can do now is to **reduce** the likelihood of irreversible death.

When will we be freed of death - when will we be **certain** of an open-ended life?

To see how far we have to go - first a **quick** look back to see how far we have come and where we are.

In recent decades life and death have taken on a new meaning. Cumulative breakthroughs in medicine - biology - bioengineering - synthetic intelligence - microminiaturization - space travel and other frontier fields have blurred distinctions between the real and the unreal.

Transplants (of major organs) Implants (of synthetic organs)

Rejuvenation

Slowdown of aging

Gene therapy

Transgenesis

Frozen organs and embryo Brain/computer hookup

Memory transfer

Smart robots and androids

Micromachines

Redefinitions of death

Resuscitation

Brain/body decoupling

Life support and cryonic suspension Space colonization

All the above advances are fundamental departures from age-old universal premises of normal human life.

In just a few stunning decades we have forever turned reality upside down. Not long ago such radical departures from age-old norms - if anyone dared envision them - were irritably dismissed as "fantasy." today many of our forecasts of breakthroughs in the 21st century are no less irritably dismissed as fanciful.

Skeptics never learn.

In the early decades of the new century life and death will take on yet more radically new meanings.

Major scientific advances now gaining momentum will converge and crystallize early in the new century yielding a cornucopia of spinoffs in all areas of life.

We will transition to absolute immortality - not as a result of any one breakthrough - rather as a culmination of the cumulative confluence of advances in many areas.

We will close in on immortality from many directions.

Absolute immortality is a logical outcome only when seen in the total context of the future. Not in the context of the present.

What is the context in the early decades of the new century?

Tens of millions of people will be over eight-five years and going strong. Powerful lobbies and an enormous market will push for more radical slowdown of the aging process and better protection from killer diseases and accidental death.

Extended life expectancy-rejuvenation-resuscitation loosening of hardship values - will embolden us to overcome resignation to aging and death. People will just not want to die. We will be receptive to anything that will help us overcome the fragility of our biological makeup.

Replication and modification and replacement of human chromosomes and genes will enable us to make startling alterations in our bodies and heads. This in turn will embolden us to take greater liberties with our pristine bodies.

Tensofmillionsofpeoplewillbealiveandvigorous thanks to synthetic body parts and to replacements of replacement parts. Millions of others will have started life through high-tech reproductive techniques. We will therefore not be purists about our bodies. The flesh-and-blood body will not have the mystique it has long enjoyed. We will be drawn to new colorful high-tech bodies that will allow us unprecedented safety and versatility.

Intheearlydecadesofthenewcenturythousandsofus will translive in space communities. Thousands of others will routinely shuttle back and forth on quick transsolar treks. The rush to the high frontier will be in full swing. This in turn will reinforce the need to create new spaceadaptable bodies.

Ultra-smartrobots-cyborgs-androids-andothernonhuman clones will be everywhere. By coupling with these lightspeed systems we will accelerate our own evolution - taking thousand-year leaps every few years. The tracks outlined will overlap - they will invigorate one another - accelerating us toward absolute immortality. By 2030/2040 we will have slowed down the aging process dramatically.

Rejuvenation of the brain and body through genetic engineering - cell regeneration - immune reconstitution - memory boosters - organ replacement will be commonplace.

Distinctions between young and old will continue to blur. In years to come it will be difficult to distinguish many an eighty-yearold from a thirty-year-old.

The introduction of intelligence into more and more areas of life (home - transportation etc.) will significantly reduce - but not yet eliminate - accidental death.

Soon the death rate (in the more advanced areas of our planet) will have dropped sharply.

Resuscitation measures which began sporadically in the second half of the 20th century will be an integral part of health services. Reanimates will be more and more commonplace.

Total death will be rare. More often death will be partial and reversible. The organic parts of a person's brain and body may suddenly terminate (as in an accident) but the synthetic replacements will go on functioning normally. Such a person will be only partially dead - in organic arrest yet very alive.

Upon reading his obituary printed due to a reporter's error, Mark Twain said, "Reports of my death are greatly exaggerated." This is funny precisely because it violates the universal assumption of the finality of death. In the coming years such a remark will not be a contradiction. A person may be dead and alive at the same time.

In case of an imminent crisis - or even sudden death - molecule-sized robots may be released in the body to make the necessary corrections or even take over many vital functions.

Telecommunication and teleded will be so widespread that in case of sudden death instant teleresuscitation may be attempted. For example the heart may be jumpstarted back to life by remote signals. (Bear in mind that the synthetic parts will continue functioning - kept alive by their own energy units.)

In case this fails a person may be rushed to a Recovery Center and placed in a Resuscitation Capsule. A high-speed holographic imaging unit will scan the entire body and brain. A Medical Expert System will swiftly process the information and decide on the best reanimation procedures. The Resuscitator will then correct and reactivate the non-functioning parts. The focus will be the brain.

Long-term suspension will make no sense. The dead and the partially dead will be treated immediately. This is because there will probably be no incurable diseases and aging will be slow.

"My friend Andriano was killed in a terrible accident yesterday."

"How shocking. When will he be brought back?"

"We expect him back in a few days."

Funerals - burials - mournings will increasingly be relics of our tragic mortal past.

One day smart standby bodies will be available to anyone whose own body is in irreversible phase-out. A badly dead body may not be salvaged. Instead we will revive the dead parts of the brain and introduce a brand new body.

These glamorous new bodies may also appeal to people who want a smart modern look, and to extraterrestrial travelers. Around this time the human body will generally be viewed as replaceable and expendable - the way we now view our organs.

"So long as I have my brain what do I care about the body?"

We will be able to transfer (download) the brain's contents to a standby module. The salvaged contents may only comprise desirable memories - desirable personality traits and aspects of one's intelligence.

We will also keep redundant copies of our minds in safe storage. In case the original person is irretrievably lost a backup copy of the brain is reactivated and given a brand new body.

Absolute Immortality At Last!

After millions of years of pain and sorrow and the inexorable inevitability of aging and death - we will at last break free.

We will break free of the struggle for survival.

After millions of years of dreading death and craving life - we will at last have nothing to dread.

How will we respond to the fulfillment of our dream of the ages? Will the entire planet and space communities explode in celebrations? How soon after absolute immortality will people let go of fairy tales of hereafters and reincarnation and actually dare to take steps to live forever? No one can accurately predict.

Millions of years of mortal life have left us all numb and basically resigned to death and therefore even in the foreseeable future not everyone will let down their guards to benefit from this breakthrough of the ages. What matters is that for the first time in all the eons of human life the imposition of death will be lifted.

What matters is that for the first time in all the hundreds of millions of years of biological life - a species will have made a lifeand-death breakthrough and actually overcome finiteness.

What matters is that for the first time ever it will be possible for each of us to break free of the terminal body and brain in which we have for so long been entrapped.

For the first time it will be possible to live forever - and to know that you will live forever.

For the first time human life - though still brimming with problems - will be free of tragedy.

For the first time - Time will cease to matter.

What will matter is immortality will in time transform us into secure wondrous new Beings.

We leaped over a major Evolutionary Divide in the second half of the 20th Century when we broke free of our planet.

We will leap over another major Divide in the first half of the 21st Century when we break free of our mortal bodies.

Death be not proud though some have called thee Mighty and dreadful, for, thou art not so, For those whom thou think'st, thou dost overthrow, Die not, poor death.

John Donne, Annunciation

THE COUNTDOWN HAS STARTED

The countdown to immortality has started. More and more of us can never again be content with lifespans of a few short decades.

We can never again be content with human rights - civil rights - gender equality - political freedom.

We are now far more ambitious. We now want more fundamental freedoms.

We want the freedom to take charge of our own evolution.

We want the freedom to phase-out biological limitations which are at the root of all inequalities and all human tragedies.

We want the freedom to design and create our own bodies.

We want the freedom to modify our biochemical brains so we can at last have free will.

We want the freedom to roam around the universe.

We want the freedom to be around a hundred years from now a thousand years a million years. We want to live forever. So long as there is death no one is free.

We who are now able to restore and replace genes —

We who are able to reconstruct the entire person — We who resuscitate the dead —

We who live for months and years outside this world —

We who send rocket ships into interstellar space and flash signals across our galaxy —

We who decode light streaming in from the presumed edges of the universe over 15 billion light years away -

We who have the genius and the daring to do all this and more - can surely now mobilize to attain our ultimate liberation - immortality.

One final Herculean effort and we will realize our oldest and deepest longing - the desire not to die - the fervent desire to live on.

One final leap will take us over the Great Divide - we will be Immortal - Free Forever - Free Forever - Free Forever in the Universe.

In every century there have always been those who dreamed and said "why not? [ECH]" The response was "because it is not possible!" And over the millennia the naysayers have been wrong, the visionaries right. Whatever the human mind can conceive of can be realized.

Jules Verne wrote of exploration by submarine and balloon; *Buck Rogers* and *Dick Tracey* were comic strips featuring space travel and futuristic electronic gadgets. Parents laughed at children who insisted it could come true. And yet most of it has come to pass. Think Daedalus, Da Vinci, Marconi, Edison, Braun, Ley, Gates, think...

The Uncanny Prescience of FM-2030

OPTIMISM ONE, 1970

Power of Technology

It is true that modern technology is growing more and more powerful. But the more powerful it becomes the more diversity it generates. Powerful communication satellites can reach every person on this planet. In so doing they also open up the world to every viewer.

Non-Violence

As technology continues to advance, world events will be even more comprehensively and promptly reported leaving people with the impression that unrest and violence around the world are rising, though actually in proportion to population growth they are diminishing.

If at times it seems that violence is increasing in our world it is only because we are now more informed, more involved, more sensitive.

Humanization of Mankind

The rapid humanization of mankind is the most noteworthy breakthrough taking place in human nature.

As we gather and integrate more and more knowledge and self-awareness, as the cumulative benefits of scientific and technological breakthroughs gain momentum, we will continue to alter and refine our environment, in turn accelerating our own human evolution.

Regionalism

Today as regionalism is breathing life into sterile fragmented economies, other powerful universalizing forces are at work

dismantling the psychological, social, and political barriers that have long fragmented mankind.

Converging Mankind

It is the tourist with his enormous economic power who is actually compelling governments around the world to alter their policies- liberalize censorship, allow greater freedom of speech, rescind puritanical laws, beautify cities and towns, expand communication and transportation facilities... It is this daily contact of tens of millions of foreigners reinforced by global trade and technology that is steadily pushing the world toward a universal language, universal currency, and higher standards of living.

Universalizing Technology

Within a few years we will be able to establish instant communication- by radio, television, telephone, computer, laser with any town or city in the world... Modern technology is revolutionizing and denationalizing all aspect of life... No conquering army can intrude as deeply and as totally as modern technology.

Revolutionary Movements

Every age has its own revolutionary movements and its own weapons. Regionalism, continentalism, universalism are revolutionary movements of our times. Global communication and transportation our most effective weapons.

UP-WINGERS, A FUTURIST MANIFESTO 1973

Space Age Technology

We are now at the beginning of an epochal technological transition... Space Age Technology is a new dimension in human life. This is a technology that can reach the moon in nine hours. Whip messages across the planet in seconds. Make astronomical computations in microseconds. Perform physical mental and managerial tasks.

Space Age technology is global involving everyone and every facet of life.
Cybernation

Cybernation means not only less and less work but also greater freedom within work. Through the use of computers, satellitephones, ... teleconferences two-way TV

[Skype]...videophones people can now do more and more of their work directly from home...it is less necessary to emphasize rigid work schedules or rigid office attendance ...Cyberated economies also lead to the steady obsolescence of cash-money and the rapid emergence of credit systems...credit systems enable the individual...to make small or extensive transactions anywhere on the planet without transferring or even carrying any cash at all.

Universal Communication

UniCom has suddenly exposed governments to public view rendering them highly vulnerable to national and international public opinion.

UniCom is providing a powerful platform for dissent.

UniCom is inherently beyond the control of governments and groups. If a government controls the press and the mass media the world still comes tumbling though by way of foreign publications foreign radio films television people on the move...

The stronger mass communication within a country the stronger the people the more vulnerable the government...

Many of the greatest upheavals today take place outside government-the biological upheaval the women's liberation, the sexual liberation the environmental movement the consumer uprising the information explosion the planetary convergence....

Genetic Engineering

Every day the mysteries of the human cell are decoded, the DNA created, techniques developed for genetic surgery, gene manipulation ...All with the help of lasers chemicals viral insertions...Such extensive genetic interventions will not only enable us to correct genetic or hereditary problems, what is infinitely more transcendent they will enable us for the first time to create entirely new kinds and forms and shapes of human life.

The Cyborg (Human-Machine Life)

We are also evolving from the animal-human to the human machine. This is a gigantic evolutionary leap...We are in the age of the cyborg. Individuals with dacron heart valves transistorized pacemakers electronic limbs electronic bladders artificial kidneys silicone breasts contact lenses porcelain teeth...Then too individuals with ear phones attached to their heads walking

around listening to music or voices from faraway sources... We also have machines robots teleoperators computers automated and cybernated systems performing more and more human functions-mental managerial and physical... This fusion of the human and the machine is gaining momentum...

TELEPHERES 1977

Communication

Electronic Phones-laserphones-headphones...videophones-picture phones...Two-way TV-cable TV-closedcircuit TVVideocassettes, etc.

Health Care

Telemedicine...biotelemetry...telemonitor of implanted organs-patient telemonitor...telediagnosis...picturephone checkups...informed retrieval...

Education

Teleducation-multimedia and multisensory learningtravel...global teleseminars-telelectures-info retrievals...

Information outlets

Telelibraries-mobile libraries- telebooks-telenews telecomputers...

Art Multimedia art- total environment creations-video imageries laser imageries-holographic imageries...

Supply

Teleshopping-telemerchandising-computerized supply systems-direct telefactory to consumer economies...

Work

Shorten the workday-workweek...Distribute and scatter jobs by shifting to a ...four day workweek...Computers and cybernation accelerate production output while diminishing labor input...Let us do away with enforced retirement. Retirement must be voluntary at any age.

Teledemocracy

Eventually...all dictatorial regimes will have disappeared. They will have receded into history along with tribal systemsmonarchies-colonial rule.

Globalism

Today even spheres of influence are breaking down... Communist parties around the world are breaking away from Moscow. More and more U.S. puppet regimes are asserting autonomy. Global power is decentralizing. ... Détente between Communist and Capitalist camps has also evolved not because of changes in the ideologies of the leaders, but because of the intense pressures of global forces: global communication-world trade-world resource interdependence-common markets and regional associations emergence of liberated states-world tourism international agencies. ... Unicom is helping spawn global forces which governments can no longer contain.

Opinion Polls

Public Opinion Polls... increasingly deployed to canvass people's views... influencing government decisions. In the years ahead opinion polls will be conducted more frequently-efficiently rapidly-universally.

THE NEW YORK TIMES , TUESDAY, JULY 11, 2000 Many of his predictions were prescient. In a 1977 interview, he spoke of correcting genetic flaws and of fertilization and gestation outside the body. In 1980, he wrote of teleconferencing, telemedicine and teleshopping. He argued against the assumption that many more nursing homes would be needed in the 21st century, on the basis that health standards would improve, making nursing homes less necessary.

***ANDALLOFTHISHASCOMETOPA
SS! WHYNOTHEREST?***