

Life Extension And Transhumanity

DR.RUPNATHJI(DR.RUPAK NATH)

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In designing this *Guide*, I had to decide the nature of its guidance. I chose the path of introducing the newcomer to diverse, rather than congruent, perspectives. Readers are able to think for themselves; guidance thus comes in the form of introducing the reader to new ideas, even if the new ideas contradict each other.

What Chapter 2 Is About

William Faloon, Director of the Life Extension Foundation, is convinced there are things we can do today to significantly extend our own personal healthy lifespan. He refers specifically to the right amount and mix of dietary supplements. He pinpoints contradictions and omissions in a recent 512-page book sponsored by the National Academy of Sciences that attacks dietary supplements. Moreover: "By prolonging our healthy lifespan, we put ourselves in a position to take advantage of future medical breakthroughs that could result in dramatic extensions of human lifespan."

What Chapter 3 Is About

Christopher J. Phoenix of the Foresight Institute gives us a general overview of future nanotechnology with reference to life extension -- or, as he puts it: "This chapter is not really

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about life extension. Instead, its focus is on health extension: keeping the body in a state of good health." (Molecular nanotechnology is technology at the small "nano" scale, such as future molecular-scale engineering and manufacturing.)

Airplanes fly differently than birds -- but birds showed us that airflight was indeed possible. Likewise medical nanotechnology will be developed; for example, red blood cells already travel through our body to our benefit -- showing us that medical nanotechnology is indeed possible. Within fifty years, such technology should revolutionize medicine -- resulting in hugely substantial health improvement and life extension. For many beneficial purposes, airplanes are superior to birds -- and future nanotechnology will be superior to red blood cells and other presently existing nanotechnology.

What Chapter 4 Is About

Robert Freitas focuses on one kind of future nanomedical device, the "respirocyte" (as he calls it). It is an artificial mechanical erythrocyte (red blood cell). Its amazing implications for enhanced biological health and cell repair are detailed. Just as artificial mechanical birds (airplanes) can perform many flight-related feats beyond the capacity of birds, so artificial red blood cells will be able to perform many health-related feats beyond the capacity of red blood cells.

What Chapter 5 Is About

Nick Bostrom of the Yale University philosophy department is convinced that "transhumanism" is an idea whose time has come. The evolution and fusion of infotechnology and

biotechnology -- whether in the form of nanomedicine or otherwise -- clearly shows that many previous philosophers and scientists have been working under a false assumption. Today it is obvious that human nature and the human condition are not constant (as previously believed) but are open to radical modification and ongoing redesign. It seems that the idea that life is a zero-sum game is not merely false -- it is radically devious. Thus humans have already begun a series of steps from the old "human" to the new "transhuman." At the same time, one possibility may be that either humans or transhumans will destroy all known life.

The following are no longer science fiction but plausible possibilities:

- Machines more intelligent than humans in every way.
- Lifelong emotional well-being and euphoria without feeling "drugged" or having negative effects on one's cognitive abilities.
- Take a pill to overcome shyness or enhance empathy.
- Living in huge space habitats we cost-effectively construct; they are earth-like, even more earth-like and comfortable than living in the biosphere of earth.
- Molecular-scale manufacturing and nanotechnology.
- No limit to maximum lifespan.
- Extinction of all life or all intelligent life: Terrorist attacks or unforeseen accidents using "old" (twentieth century) or "new" (twentyfirst century) technology. In our new world, perhaps offense has a huge, even decisive, advantage over defense?
- The world is interconnected via the internet or otherwise.

- Fusion of humans and machines; migration of minds from biological to virtual worlds; virtual backup copies of minds (unlimited lifespans).
- Reanimation of patients in cryonic hibernation.

Bostrom points out the need for all persons (not just so-called "experts") to discuss these possibilities. This may be one way to protect ourselves against misguided philosophical, scientific, or other questions, detect facts, solve problems, learn from mistakes, be optimistic. Can technology solve **all** our problems? "The best technology could do is to help you create the conditions under which your love could flourish and grow indefinitely, unencumbered by the erosive forces of current material and psychological conditions."

What Chapter 6 Is About

Rael (also known to some as Claude Vorilhon) is the spiritual leader of the International Raelian Movement and the founder of the first human cloning company, Clonaid. (Currently, it appears that the first human clones will be produced in or around 2002 or 2003.) Based in part on personally experienced UFO encounters of the third kind, Rael offers his perspective on the philosophy of transhumanism. (During his UFO encounters, he met "those beings from space, the Elohim our Creators, who entrusted him with a mission.")

If it turns out to be possible for our personality to migrate from the biological world into the world of electronic computers, then we would be eternal. As a virtual entity we could experience the biological world as if we were biological but we could experience the virtual world as well. We would have a choice of experiencing a virtual world as

virtual -- or we could choose total immersion (thus the virtual world would seem altogether real). We could meet other persons (some real and biological, some real and virtual, some fictional) for sexual, philosophical, or other purposes. Real but virtual children designed by us could be produced, requiring real parental responsibilities on our part.

In such virtual worlds we could have all sorts of virtual things: huge mansions, luxury planes, attractive associates. But there would be little to worry about in terms of pollution, war, death. "If all of humanity lived like this in computers, there would no longer be any pollution or violence on earth." Self-protection would take the form of numerous backup copies of our self strategically placed throughout the universe. One could always grow oneself a biological body for ones own use if desired.

We could seed new worlds. "At first these humans we created would believe us to be gods, but then they too would discover science." Then they would "create a new virtual world and start the whole cycle again."

Once we have established computerized bases throughout the universe, then all we need is telecommunication to "travel" to these bases throughout the universe. Only our personality, not biological body, is needed. Each base would have the ability to build a biological body of our choosing, if desired.

But in one scenario, one can imagine biological entities who are terrorists that are dangerous to virtual eternal: "to escape such dangers, the computer entities might decide to exterminate the remaining biological humans." It would be "as if butterflys that achieved eternity were to kill all the caterpillars." Moreover: "it is possible to completely stop evolution, if such a thing even exists." If a superconscious

computer exterminated "the violent and disrespectful species called Man, while leaving the rest of the planet along with all the other animal and plant life untouched, would it really be such a bad thing?"

Vernon Vinge has indicated that one day there will be a "singularity" or threshold to metamorphosis beyond human: Humans create Superior AIs; then Superior AIs create Super Superior AIs; ad infinitum. Perhaps this could happen in a few years, then a few months; ad infinitum. We should "stop insisting that man must be the absolute master of the universe." "We are penetrating into a universe where even the most extreme miracles we can imagine are pittance compared to what will truly be possible. ... the amount of things that we can imagine is limited, but the number of things we cannot imagine is infinite."

What Chapter 7 Is About

Robin Hanson, assistant professor of economics at George Mason University, calls for a spirit of humility, if not empathy, when we dialogue with each other on important or passionate issues. We all have our biases or engage in dreams (wishful thinking). Often we are blind to our own biases while seeing (so we think) the biases of others.

Although many of us expect huge changes to take place during the twentyfirst century, nevertheless many knowledgeable people predict relatively modest change. "Dreams of autarky" may bias many of those who expect huge changes: "Specifically, my claim is that futurists tend to expect an unrealistic degree of autarky, or independence,

within future technological and social systems." Even after correcting for this bias, it may still be reasonable to expect some rather big changes.

Why do humans tend to expect "autarky"? For one thing, our minds evolved to operate autonomously. In addition, many of our human ancestors functioned within the framework of small autonomous tribes. But with civilization came cities and experts. Although urbanization and specialization made us rich beyond our ancestors' dreams, we still dream for autarky. "For example, people are surprisingly willing to restrict trade between nations, not realizing how much their wealth depends on such trade."

The dream of economic or societal autonomy takes many forms, including the following:

- Space Colonies Soon. It is tempting to believe that soon (within one or two decades) mass space colonization will begin -- historically analogous to the colonization of the Americas. But closer examination shows the analogy will not hold up.
- Genie Nanotech. While nanotech (atom-level control of matter) will have considerable effects on our economy, the unrealistic temptation is to go beyond this into belief in "genie nanotech." Genie nanotech combines nanotech with "the complete automation of the manufacturing process, all embodied in a single device." But such an all-purpose "genie" requires a level of artificial intelligence far in advance of the present.
- Turing-Test Artificial Intelligence. Will we soon be able to construct a mechanical brain or artificial intelligence with the Turing-Test ability "to fool someone talking to it from a distance into thinking it was human"? The founders of AI incorrectly predicted success before the

end of the twentieth century. "We may achieve this goal by directly creating machine copies of human minds, i.e., by creating 'uploads.' The prospects for success by other approaches anytime soon, however, are not encouraging."

- Local Singularity. World economic and technological growth depends on advances made throughout the world and across a variety of disciplines. In contrast to this, some dream of or expect the coming of a local singularity: "sudden technological advances in one small group essentially allow that group to suddenly ... grow strong enough to essentially take over everything before anyone else could stop them."
- Crypto Credentials. With the advance of surveillance technologies, it may be that personal privacy will recede. But while privacy may recede in the physical realm, some dream that future technologies will expand our privacy in the digital world: "Dreams of crypto credentials hope to harness these technologies to improve our privacy." Such wishful thinking fails to consider a number of practical issues. For example: You "show a potential employer a credential that says you 'went to a good school.'" Even if they cannot find out everything about you, there may be much more they will want to know about you if you are to be employed. Moreover, people like to interact physically, not just digitally.
- Private Law. "Visions of private law imagine granting pairs of people far more freedom to choose the laws that govern their interactions." This is rather different from crossing the border of one country to take advantage of the laws of another country. Arguably the wishful thinking of private law fails to recognize the legal interdependence of people. And as a practical matter,

most people do not want to give two persons the right to negotiate a contract that otherwise would be illegal or criminal.

Yes, it may be practical for some of us to live as hermits or in isolated small communities. But most of us choose not to do so. Indeed, usually non-hermits and non-isolated communities are more advanced and capable than those living their dreams of autarchy.

What Chapter 8 Is About

Avatar Polymorph is convinced that the coming changes will indeed be immense: "self-directed evolution and full environmental manipulation." He seeks to engage the ethical issues involved: (1) Should the Intelligence Boost be applied to some humans or all humans? To pets or all animals? To some or all AIs? (2) In the long run, will not the finite physical space of the universe place limits on organisms and computers? (3) If Tiplerian possibilities (quantum transference of consciousness and scientific resurrection of the dead) prove attainable, is it ethical to "leave behind" (decide not to resurrect) **bad** persons? What about leaving behind animals and AIs?

If we resurrect bad people, we will want to provide ourselves with a protective shield. Those who choose to die may do so. We must respect free will. Those who choose to live in a non-peaceful society involving violence may do so. The "only monitoring of internal thoughts that should occur is that required for 'automatic' activation of the protective shielding mechanism." We want a world of "**maximum choice and minimum force**" -- "an interactive system of

stability and fairness." Terror, torture, and killing of animals and children are not permitted. Terror, torture, and killing of adults are permitted only if they have consented.

The first leap on our path to the Singularity or Techno-Rapture or post-Escalation will be approximately the year 2015, when everyone (regardless of age) can look youthful and be healthy. The second leap is approximately the year 2020, when full-blown nanotech will allow instant space habitats (extraterrestrial communities large and small). Finally, there is the Escalation or Singularity itself, approximately the year 2027.

Post-Escalation ethics will be different from the ethics of the transition period and earlier times when mortality (physical death) had not yet been scientifically conquered. With the Escalation or Singularity will come:

- Amortality "offered to all sentient beings": One can choose to be immortal or mortal -- or one can "wait and see how I feel later."
- Teleportation.
- Resurrection of the dead ("quantum transference of consciousness at the moment of any apparent death").
- Consent required for any action/ interaction.
- Maximum choice.
- Protection "against non-consensual force."
- Travel "to other universes."

Ethical rules (instead of "perfection according to one ideal") will allow consensual social adventures to happen. The best ethical position, even today, is that the world of the Escalation already exists outside of Earth and other worlds with developing pre-Escalation life.

What Chapter 9 Is About

Jim Yount, Chief Operating Officer of the American Cryonics Society, Inc. (a non-profit charity in existence since 1969), is like many other cryonicists in that he is interested in the question of personal identity. When "you" wake up in the morning, or after a period of cryonic hibernation, is it you or someone else who wakes up? Many cryonicists see personal identity in terms of memory -- memory as information. In those terms it makes sense to talk about uploading one's mind into an electronic computer. Other cryonicists have other points of view, but the other views seem more difficult to formulate and defend.

Most would say that when I throw my copy of Moby (the book **Moby-Dick**) in the fire, I have destroyed one copy but not Moby. But what if all copies of Moby were destroyed? Every letter and every word contained in Moby is nevertheless still available **outside** of the destroyed Moby via dictionaries.

By interviewing people who had read the book, the book could be re-written, resurrected in some sense. Although the resurrected Moby would not be exactly like the original, the resurrection project might nevertheless be seen as worth doing. As more information becomes available, we could revise it again and again (Moby 3, 4, 5, etc.).

"Beam me up, Scotty." We scan and store Captain Kirk's atom-by-atom configuration. We destroy Captain Kirk, and from different matter, re-assemble him atom-by-atom. Have we transported Kirk or have we made a copy of Kirk? Does it

make a difference as to whether we use the same atoms or different atoms? What if we use the same atoms but an iron atom in the head is switched with an iron atom in the arm?

Charlie the Hermit has one copy of Moby that is destroyed. Charlie has a pathological fear of communicating with people. Thus despite the existence of many other copies of Moby, "**observer**" Charlie has lost Moby forever. Assume that a duplicate of a person is made and that the original is destroyed. Perhaps this happenstance would not matter to the person's friends (**outside** observers) but would matter much to the original (**inside** observer).

In the process of reanimating a patient from cryonic hibernation, perhaps we may want to scan and rearrange the patient's atoms. Rearrangement of atoms in most parts of the body presumably does not have to be exact -- we only need a healthy body. In the brain area, however, more exact rearrangement of atoms may be important if we want the "same person" (yet in a healthy, youthful body). But how exact "more exact" has to be in the brain for the reanimated person to be the same person is not obvious at present. It probably will be possible to reanimate "someone" from cryonic hibernation and perhaps all **outside observers** will be happy with this result. But we must ask: Will this "someone" be "**little Ol' inside observer me?**"

What Chapter 10 Is About

R. Michael Perry became interested in cryonics in 1965, received his Ph.D. in computer science in 1984, and has worked for a cryonics organization, the Alcor Life Extension Foundation, since 1987. Throughout human history many have preferred to believe in immortality rather than being

limited to mortal existence. But science has cast doubt on immortality. Yet in fact what is ultimately achievable by science in terms of life extension and immortality is presently unknown.

Scientific teleology is a new branch of philosophy "dealing with the possible role of sentient agents in shaping the reality they inhabit to suit their own, long-term needs and purposes" -- for example, immortality. "Infinite or unbounded survival becomes immortality, a state that ... does not preclude the possibility of death" so long as death is always terminated via a suitable resurrection. Mathematician Frank Tipler is correct that the scientific resurrection of all the dead is a logical possibility. According to Tipler, the general resurrection would take place at "the Omega Point" billions of years hence. But Tipler is wrong in identifying the Omega Point with the God of Christians. This God "does not exist -- and need not exist" for a universal resurrection. "Again, it is **we** who must solve **all** the problems that are meaningful to us." Indeed, "we may develop into a civilization of benevolent immortals."

Scientific experiments show that events are more or less probable rather than exactly predictable. It is possible, but of low probability, that a pool of liquid water will freeze on a hot day. **Phase paths** are a way physicists have of reconciling a variety of reasonable theories. "The ice melting in the heat, then, is an example of following a phase path, the water freezing [on a hot day] is not."

Tipler goes with the phase paths, the probabilities, in constructing his theory of the Omega Point. On the other hand, "from the many-worlds perspective, that there are universes, parallels of ours," there are actually existing universes in which many highly improbable events are in fact

happening. But if we go with the probabilities (the phase paths), we get the Second Law of Thermodynamics (entropy increase). Tipler's way of getting around this ultimate end to the universe is to distinguish between internal (subjective) and external (objective) time. For the outsider, the Omega Point coincides with the end of the universe. For the insider, the Omega Point coincides with infinite time. On the other hand, Freeman Dyson has proposed a universe without end even from the point of view of the outsider.

Moreover: Was the "Big Bang" which started our universe an improbability, a phase path "violation" of the Second Law? Let us look at this question further. The **Anthropic Principle** is "that the observable universe must be so structured as to allow the observer to exist." Accordingly, **our** universe is not in a state of maximum entropy. Perhaps non-observer universes fit the phase path -- yet all we can ever see is observer universes. A God or conscious designer is seemingly not required if we invoke the Anthropic Principle.

An alternative "stronger" formulation of the Anthropic Principle identifies "observer" or "observer universe" with the notion of a "permanent record." Thus is proposed the IAM (Individual Anthropic Metaprinciple): "**The universe that I, as an observer, perceive, is so structured that I am immortal.**" Accordingly, "any death must eventually be followed by a resurrection, in which the observer again becomes aware of the past as well as the present."

The many-worlds theory would seem to lend strong support to IAM. "IAM asserts that, no matter what happens to the observer, there will be continuers -- and that, I think, is a hard conclusion to avoid if many-worlds is accepted at all. ...

In particular it means we are not strongly dependent on a particular model of the universe for a hoped-for resurrection and immortality."

On the other hand, the far future is a matter of speculation. But that biomedical science and technology is rapidly advancing, and that cryonic hibernation facilities have existed for decades, is beyond dispute. A universal resurrection of all dead persons (all "observers"?) in the far future offers hope for everyone. "But a better hope is provided by the possibilities that exist today for overcoming death and extending life."

**About Charles Tandy
(Self Description)**

Dr. Charles Tandy received his Ph.D. in Philosophy of Education from the University of Missouri at Columbia (USA) before becoming a Visiting Scholar at Stanford University (USA). Presently Dr. Tandy is Associate Professor of Humanities, and Director of the Center for Interdisciplinary Philosophic Studies, at the Fooyin Institute of Technology (Taiwan). For more information, see: <http://www.tandyfreehomepage.com>

Your Study Notes/ Comments:

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-- Chapter 2 --

CAN THE HUMAN LIFESPAN BE EXTENDED? A CRITICAL ANALYSIS OF THE NATIONAL ACADEMY OF SCIENCES' ATTACK ON DIETARY SUPPLEMENTS

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On April 10, 2000, the National Academy of Sciences issued a press release that stated:

“Insufficient evidence exists to support claims that taking megadoses of dietary antioxidants, such as selenium and vitamins C and E, or carotenoids, including beta-carotene, can prevent chronic diseases.”

This report received widespread media attention, and many news articles questioned the value of dietary supplements altogether. The National Academy of Sciences' press release was based on the conclusions of a 512-page book that ostensibly looked at all the published scientific literature about the intake of certain nutrients and subsequent risk of developing disease.

Contradiction And Omission

The name of this 512-page book is *Dietary Reference Intakes For Vitamin C, Vitamin E, Selenium and the Carotenoids*. This book contains a startling contradiction. The negative conclusions drawn by the authors are opposite to the positive findings about the supplements that are

described in the very same book. This contradiction is not surprising, considering that the book is authored by two “committees” comprised of 40 members.

The book omits published studies about antioxidants. It also fails to take into account that supplement takers usually consume a wide variety of nutrients to protect their health, not just vitamin C or E alone. The authors of the book did capably describe many of the positive studies indicating a disease risk reduction in response to a particular supplement. But it turns pessimistic when even one study fails to confirm the many positive ones. An example of the pessimistic tone can be seen in the following quotation that appeared on page 187:

“A large and growing body of experimental evidence suggests that high intakes of vitamin E may lower the risk of some chronic diseases, especially heart disease. However, the limited and discordant clinical trial evidence available precludes recommendations at this time of higher vitamin E intakes to reduce disease risk.”

This statement is followed by numerous pages itemizing the studies showing that vitamin E prevents chronic diseases. For instance, the author’s analysis of observational human studies shows “risk reductions of 30% to 60%” in coronary heart disease risk in those consuming the highest amounts of vitamin E. Despite these reductions in heart attack risk, the authors stated, “As of this date, there are insufficient data on which to base a recommendation for vitamin E as a heart disease preventive to the general population.” The authors did, however, raise the “safe” upper dose limit of vitamin E to 1500 IU a day.

It should be emphasized that the book essentially supports dietary supplementation for the purpose of disease reduction. In fact, this book makes a strong case that these supplements (vitamin C, vitamin E, selenium and the carotenoids) produce significant health benefits. The negative twist, however, comes when the authors conclude that there is “insufficient evidence” to recommend that the general population supplement with these nutrients.

What Are “Dietary Reference Intakes”?

The primary purpose of this book is to establish new government recommended daily allowances for vitamin C, vitamin E, selenium and the carotenoids. The new term for RDA is “Dietary Reference Intakes,” which is defined as “reference values that are quantitative estimates of nutrient intakes to be used for planning and accessing diets for apparently healthy people.”

One problem with this definition of “Dietary Reference Intakes” is that it fails to take into account that as people age, they are no longer “apparently healthy.” While some aging people optimistically claim to be as healthy as ever, aging wreaks havoc in every cell of the body. The authors recognized their limits in setting new “Dietary Reference Intakes” by admitting that they were not able to estimate the amount of these nutrients “required by children, adolescents, lactating women and the elderly.”

Unfortunately, when the press reported on this book, it failed to mention the limitations that the authors themselves placed on their conclusions. In setting these new “Dietary Reference Intakes,” the authors emphasized their limitations by stating that “scientific judgement was required for evaluating the evidence and in setting the reference values.” “Scientific

judgement” is a fancy way of saying that these new recommendations are based on the arbitrary conclusions of two committees. This subjective approach should not be confused with bona fide science, as an evaluation by another group could yield completely different conclusions.

The vitamin E recommendations are a good example of what “scientific judgement” really means. Those concerned about protecting their health take vitamin E because of studies showing “risk reductions of 30% to 60%” in heart attack risk. Yet, in the “scientific judgement” of the committees, there is still “insufficient data” to recommend that people actually take vitamin E supplements.

What They Said About Vitamin C

While increasing the maximum safe daily intake of vitamin C to 2000 mg a day, the authors of the 512-page book set the recommended daily intake of vitamin C as follows:

Males	90	mg
Females	75	mg
Smokers	35	mg additional

(to compensate for the increased “oxidative stress” smoking induces)

These doses of vitamin C, the authors noted, “should maintain near maximal neutrophil ascorbate concentrations with little urinary excretion.”

Supplement users, however, are taking vitamin C for reasons other than to maintain their “neutrophil ascorbate

concentrations.” (Neutrophils are specialized immune cells that require vitamin C to kill pathogens and still maintain their cellular integrity.)

As was the case with vitamin E, the 512-page book contains numerous pages of summaries of published papers indicating significant health benefits in response to vitamin C supplementation. One study describes that when smokers were supplementing with 2000 mg a day of vitamin C, “the adhesion of their monocytes to endothelium decreased to that seen in non-smokers.” (Monocyte adhesion is an initial factor leading to the development of atherosclerosis.) Instead of recommending that smokers take 2000 mg of vitamin C as the people did in the study, the authors suggest that smokers obtain only 110 to 125 mg per day of vitamin C.

This kind of illogical recommendation is pervasive through the vitamin C chapter. For instance, page 103 of the book states:

“Numerous investigators have reported a beneficial effect of high-dose vitamin C administration, either orally or intraarterially, on vasodilation. This beneficial effect of vitamin C is most likely related to its antioxidant effect. Vitamin C improves endothelial function and vasodilation, possibly by scavenging superoxide radicals, conserving intracellular glutathione, or potentiating intracellular nitric oxide synthesis.”

Strangely, the authors interpret these kinds of positive findings as an indication to not take high doses of vitamin C. The 512-page book makes it clear that high doses provide the beneficial effect of vitamin C on the arterial system. The