



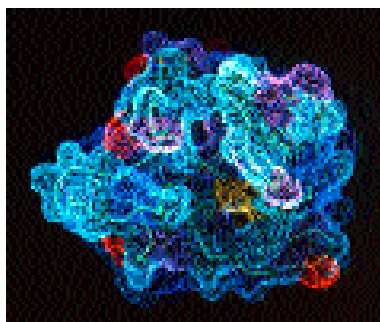
Getting Burned: Cryobiology or Cremation

By Harry Braun

Baseball's great Ted Williams is the most publicized person to be frozen after his death, but the procedure resulted in a bitter family dispute between his children, one of whom wanted him cremated. This "life or death" decision involves the definition of death. If one is cremated, for example, there is no doubt that one's death is permanent because all of the DNA and protein molecules of memory are irreversibly destroyed in the fire. On the other hand, if an individual's DNA and molecules of memory have been frozen, they are in a state of "suspended animation," which means that person is not dead at all. Indeed, given the exponential advances in molecular biology and nanotechnology, within 30 to 50 years it will be possible to repair any molecular or cellular damage that may have occurred, and allow the individual to be "reborn" with all the memories of his or her past life, into a biocybernetic "designer gene" era.

Biocybernetics involves the integration of biological molecules, computers and robotics. Proteins, like the one imaged below, are key biomolecular elements because they are at the heart of life, metabolism and memory. All DNA instructions are for the manufacture of proteins, whose 3-dimensional structures are so complex that an entirely new generation of super-computers are being developed by IBM and others to characterize their behavior. The architecture of proteins is already being used as the template for the development of "Biochips" that will be key molecular components of a rapidly approaching designer gene era, whereby individuals will be able to reprogram their DNA as easily as they rewrite a sentence in a paragraph.

Our Biological Creators

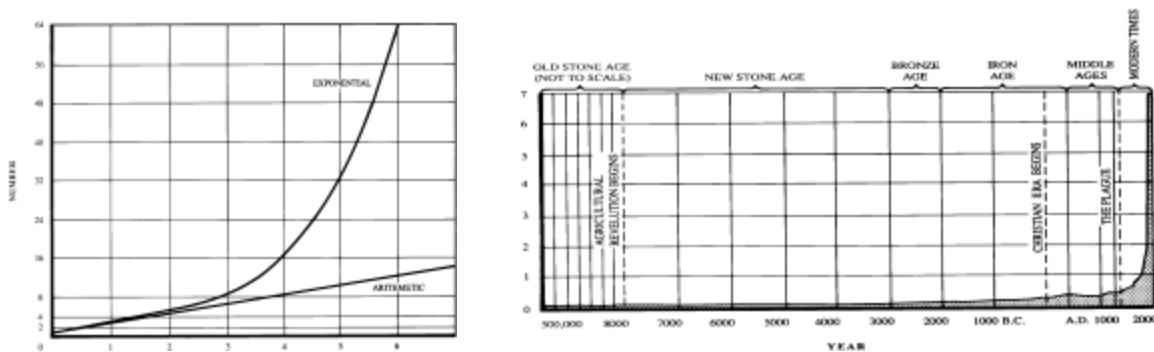


A supercomputer image of a protein-scale nanobe (left) and DNA (right)
Courtesy of Scripps Molecular Biology Laboratory

The first protein-based "nanobe" originated over 3.8 billion years ago, and it may still be alive and well because it has since given birth to every living cell and organism on the Earth. The nanobial proteins represent an ancient and highly advanced civilization that was responsible for the development and function of everything from bacteria to the human brain and nervous system. As such, the nanobes are indeed our biological creators, and they could certainly be viewed as the "spirit" or "life force" of every living cell.

The Exponential Age

We live at time where exponential growth in a number of environmental and scientific areas will soon result in utopia or oblivion. If oblivion is defined as the destruction of the Earth's agricultural life-support systems, then utopia could be defined as humanity having made a successful transition to renewable energy and biological resources. The great irony is that both utopia and oblivion are evolving exponentially and simultaneously. Because of the exponential advances in molecular biology, computer science and knowledge in general, this generation stands at the threshold of a new era of molecular medicine. Yet few people understand the significance of exponential growth that characterizes these developments. The image shown below on the left shows the difference between arithmetic growth and exponential growth that increases at an increasing rate. The image on the right shows the exponential growth of the human population – *which is now going vertically off of the page*. Ultimately it is a question of more and more people competing for fewer and fewer resources.



A simple but graphic example of exponential growth is to consider what happens if one penny is saved on the first day of the month, and each day thereafter, the amount is increased at a constant rate of one cent per day. At the end of a 31-day month, one has accumulated 31 cents. However, if the amount is exponentially doubled each day, at the end of a month one will have accumulated over \$10.7 million – *an increase of over 34 million percent*. That is the extraordinary power of exponential growth, and it is because of the exponential advances in molecular biology that the rapidly evolving field of molecular medicine will soon be able to not only regenerate cryogenically preserved patients, but eliminate the molecular mechanisms of aging and disease as well. This ability to change the genetic and amino acid codes that make up the molecules of life will be the most significant development in the history of life itself. As Dr. Hans Moravec, the Director of the Robotics Institute of Carnegie-Mellon University has observed:

"We are on a threshold of change in the universe comparable to the transition from non-life to life."

Harry Braun, is a graduate of Arizona State University, and has been an active member of Alcor, the non-profit cryobiology laboratory that froze Ted Williams, for more than a decade. He is CEO of Sustainable Partners, LLC, a renewable energy company, and is author of *The Phoenix Project: Shifting from Oil to Hydrogen* (phoenixproject.net), which has an entire Chapter (Utopia: From Here to Eternity) devoted to the subject of Biocybernetic evolution. For more information, contact Lucille Hays at the telephone number, fax or email address listed below.



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