

Epilogue

This book touches upon many fields of science and technology. They range from high energy physics to computational mathematics, from astronomy to geophysics, from material sciences and device physics to medical procedures, and from medical equipment to isotope enrichments. They follow a common theme that in order to solve or resolve a technical problem, the best solution could often be obtained or borrowed from fields beyond where the problem lied. To do so, it requires a high degree of freedom to navigate or the freedom of unbounded thinking process plus, needless to say, certain dedicated efforts to seek the solution. Marching under an ignorant tyrant helmsman and forced to get busy is contrary to this free spirited voyage. Having a planned economy as well as a planned thinking process in order to organize a uniform stepping procedure could indeed provide a high degree of efficiency temporarily, but the price is usually much too high for those involved, would kill any and all incentive to thinking through anything, important and such a procedure could never work over the long haul. I am extremely fortunate to have functioned with a life-long freedom in the U.S.

One area of endeavor I have not touched upon is the aspect of management. Since I could hardly manage myself, I would not apply this lack of experience to manage others. All our enterprises are limited to a small number of technical persons, and have avoided what Gus Kinzel called the “stage 4” developments. We have assigned others to run the stage 4 efforts. While we have consciously avoided to carry out the stage 4 business, I was surprised to learn that the U.S. Defense Department has ranked us in the 95 percentile among all small businesses doing R and D to carry out stage 4 activities.

Now a few words on what breaks can be anticipated in science and technology in the coming few decades. From the human genome project, we have learned that of our twenty some thousand genes making proteins for cells, similar genes can be found in many other species of animals, fishes, or even plants and bacteria. What makes humans unique seems to be not just these specific genes, but more importantly the switching mechanisms; when to turn-on, when to turn-off, and for how intense and how long. It is an extremely busy orchestra with tunes, themes, and variations involving not only the protein-producing instrument, or the 2% of the genome which we have largely deciphered, but also the remaining 98% of the non-protein-producing genome, including the switches, which we know virtually nothing about. The recent development of fluorescent molecules to illuminate the genes in expression have become a major tool for the molecular biology, and I believe that the use of spin-1/2 stable isotopes together with magnetic resonance or X-ray microscope could be another important tool in the analysis of the remaining 98% of the genome and thereby serve the anticipated major discoveries in embryology, ontology, and brain functions.

Summary of Simple Tech Innovations

Chapter 1. Astrophysics

Limiting Mass of Neutron Star (Minimum and Maximum)
Hawking's Radiation and Gamma Ray Burst
Big Bang Expansion and Solar Wind Acceleration

Chapter 2. Numerical Analysis

Difference Equation for Differential Equation
Bethe-Goldstone Equation
Monte Carlo Data Manipulations

Chapter 3. Isotope Enrichment

Solar Wind Time-of-Flight Separations
Ventilated Turbine Blade Separation
Supersonic Fluid Separation

Chapter 4. High Temperature Silicon-based Semiconductor

Silicon Carbon Superlattice Si/C
Semiconductor on epi-Insulator SOeI
Si/C as Substrate for GaN
Si/C, Si/CO, and Si/O for High T Solar Cells
Epi-Insulator for High and for Low Dielectric Constant

Chapter 5. Integrated Clean Energy

High T Solar Cell Coupled with Quantum Wells
Si/C Superlattice for Lithium Battery Anode

Chapter 6. *Non-Coolidge X-ray Tube*

X-ray Microscope
Low Dose Mammography
Solid Phase Amplifications for Immunoassays
High Power, High Efficiency X-ray Generator
Bandgap Cascade Cold Cathode

Chapter 7. *Smart Drug Development*

Spin ½ Isotopes for fMRI
Phase III Clinical Trails with Phase I and II Costs

Chapter 8. *My Allergy and Macula Degeneration*

The Development of Myopia in Youth
Macula Degenerate, Wet and Dry Kinds

Chapter 9. *Type II Diabetes and Alzheimer's Disease*

Beta-Amyloid as Diagnostic as well as a Therapeutic Vehicle
Pulsed Insulin for the Liver-uptake

Chapter 10. *Three Smart Chemotherapies*

Nuclear Chemotherapy – Smart Chemo I
G₀ Gated Cell Cycle for Chemo – Smart Chemo II
Lysosome-based Localized Chemo -- Smart Chemo III