

Chapter 2 Facts of the Cold Fusion Phenomenon

“I do not know what I may appear to the world; but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.” Isaac Newton, (From BREWSTER, *Memoirs of Newton* [1855], vol. II, Ch. 27)

Modern physics, the foundation of the 20th century science, had its basic discoveries just at the turning years from the 19th to the 20th century, perhaps by accident. (Cf. Appendix D, Topics 2, Radioactivity, Alpha, Beta and Gamma Rays and Topics 4, Quantum Born as a Result of Trial and Error Process.) Two outstanding discoveries are the quantum hypothesis by Max Planck in 1901 and the special theory of relativity by Albert Einstein in 1905. By these theories, physics and classical science was born in the 16th century innovated basically. It became clear that principles of science have their own realms of applicability.

Microscopic and macroscopic objects obey different fundamental laws describing their states. Low speed and high speed (compared with the speed of light, which is a constant measured from any reference system) objects obey different laws of motion.

Principles of quantum mechanics accomplished by the end of the 1930s applied to solid-state physics. Electronic theory of solids was established to explain various features of solids including electric, magnetic, optical and thermal properties and formed the basis of modern microelectronics, which induced the information revolution in late 20th century society. Who could foresee this tremendous reform of society in the 1930s?

At the epoch from the 20th to the 21st century, it seems nothing special occurred in science. The confusion in computer systems related to the transition of the clock from 1999 to 2000 in each computer arose in the summer of 1999 as only an episode related with the transition of a calendar. Instead of such epoch making events that occurred a hundred years ago, there occurred, however, a gradual paradigm change from simple systems to complex systems in our frame of reference. Modern physics including classical physics established in these 400 years has flourished simplifying objects extracted from the complex real world as far as possible confining region of investigation thus making possible to treat them mathematically and rigorously. There was necessarily abandoned vast realm

of reality behind the world finely arranged in modern physics.