



# Prologue

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The understanding of life processes, over the last two millennia, has moved from organs, to tissues, to cells, and to molecules. Correspondingly, the methods of identifying alterations in structure and function have also moved from morbid anatomy, to histopathology, to cell biology, and to molecular biology. Nothing illustrates this better than the history of the Nobel Prizes. The first ever Nobel Prize, in physics, was awarded in 1901 to Karl Wilhelm Roentgen, Professor of Physics at Wurzburg, who announcing his discovery of a ‘new kind of ray’ in 1896, illustrated the publication with a photograph of the left hand of his wife with its bones and the wedding ring, illuminated against the silhouette of the surrounding flesh. That discovery revolutionized medical diagnosis in the same way as Laennaec’s stethoscope had done in 1816. Thanks to both these discoveries, living body was no longer a closed book; pathology could be studied in the living : it need not always be morbid !

A century later, by a strange temporal coincidence, the Nobel prize in 2003 was awarded jointly to Paul C. Lauterbur and Sir Peter Mansfield for their discoveries concerning magnetic resonance imaging (MRI) a discovery which opened a new window to look into the human body. Although the principle underlying magnetic resonance had been discovered in 1946, for which the Nobel prize was awarded to Felix Bloch and Edward Purcell in 1952, it took nearly three decades before the discovery could be applied for the benefit of mankind. Unlike X-rays and CT, the method does not use ionizing radiations. The usefulness and the safety of the procedure led to its rapid development. In 2002, approximately 22,000 MRI cameras were in use worldwide, and more than 60 million MRI studies were performed.

The interdisciplinary nature of scientific research and its application to medical practice is

symbolized by the fact that Roentgen was a physicist, and so are Lauterbur and Mansfield. Thus, basic research, clinical science and technology, working in tandem and reinforcing each other, have characterized the cutting edge of modern sciences, revolutionizing diagnostic procedures and imparting a degree of precision that was hitherto unknown. To many, interdisciplinary research is a most recent concept. It is not. Aristotle (384 - 322 BC), himself a doctor's son, went to Athens to study with Plato, and was among the early pioneers to use animal dissection for learning the interrelationship between the structure and function of various organs. With a prophetic vision, Aristotle stated :

“The natural scientist has to investigate also the basic causes of health and disease, which cannot occur in non-vital things. That is the reason why most of the natural scientists finally turn towards medical research, while the more advanced and far sighted physicians will utilize the principles of natural sciences”.

Most appropriately, the opening chapter of the book deals with concepts and advances in diagnosis and therapy. It is a most stimulating narration of how underlying concepts in physical sciences lay the foundation of new diagnostic procedures and therapeutic modalities with wide ranging applications in the diagnosis and management of clinical disorders. It also reaffirms Aristotlian aphormism and demonstrates why physicists such as Lauterbur and Mansfield turn towards medical research, and why eminent physicians like &rs R.D. Lele and Lekha Pathak utilize, both in precept and practice, the principles of life sciences. Indeed, several contributions by well recognized physicians in this book provide a blend and balance of basic sciences and clinical practice.

Tremendous growth and enormous power and reach of modern medicine has resulted in one of the major dichotomies of our times. This is the dissociation of the content of life from the quality of living. While the biomedical scientists continue to improve upon the definition of what is not life i.e. death, the sociologists and economists face an equally difficult challenge in not only giving a definition but a numerical rating to quality of life. It reflects upon the erudition and scholarship of Dr. Lekha Pathak that a sagacious discourse on these topics have been included to provide not only a backdrop but also an intrinsic perspective of the very nature and essence of medicine. The preservation of man's life should embrace also the utmost regard to his dignity, feelings, tenderness, and the privacy of his sentiments. A strict adherence to these principles, according to a Vedic invocation, enables a physician 'to achieve success in all his professional undertakings (Karma-sidhi), beside earning well (Artha-siddhi), attaining recognition and celebrity status (Yusolabha), and also heavenly abode (Pretya svargam).

Obviously, it is only a harmonious blend of antiquity and continuity that can serve as an inspiration to our present and future generation of students, and hopefully to the teachers also.

Dr. Lekha Pathak, Dean, Indian College of Physicians, deserves deep appreciation and felicitations for a well planned and meticulously executed academic assignment.



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