



Alfred Nobel at the age of about 30 years (Courtesy of the Nobel Foundation).

Nobel Prize rewards new discovery, the product of exploration beyond the edge of the known into the vast spaces of the unknown and mysterious (Baruch S. Blumberg, Nobel Laureate in Medical Sciences, 1976). It concerns a phenomenon of major importance and its unravelling has a huge impact for the way science is conducted subsequently. To receive a Nobel Prize is an incredible honour that brings an unprecedented respect and recognition from colleagues and perhaps the world at large. In addition to the recognition by the scientific establishments, Nobel laureates acquire a prestige to make authoritative statements even on matters outside their field. What is it that confers on them the unique privilege? Have all the Nobel Prize-winning discoveries really revolutionized our understanding on medicine to the expectations? And have they fulfilled the laudable intention of recognizing discoveries that are 'to the benefit of mankind'? One possibly gets some ideas after reading this book.

Nobel Prize recipients receive a large sum of money, but the absolute value of the prizes has varied markedly. At present it is well in excess of one million US dollars. It should be emphasized, however, that it is not the amount that gives the Prize the prestige. The Prizes are awarded by the Royal Swedish Academy of Sciences, in accordance to the will of Alfred Nobel, drawn up in November 1895. The Prize ceremony is always on Nobel's death day, the 10 December. The world saw one of the largest gatherings of intelligentsia in one and the same place in the 100 year jubilee of the award in 2001, when all previous laureates were invited to Stockholm.

Norby's experience highlights the significant challenges the committee members face in wisely selecting Nobel Prize winners, that the people, including the recipients are largely unaware. Nominees for Nobel Prize in Physiology or Medicine are evaluated at three levels: (i) short notes for relatively weak candidates, (ii) preliminary review of a few pages for stronger candidates, and (iii) exhaustive analysis for the strongest candidate. A preliminary review precedes a detailed analysis. The decision document is a record of the concluding meeting of the Nobel Committee, comprising of the three-member committee with adjunct members chosen annually. It presents a list of the major candidates and comments on their Prize-worthiness. The selection process for Nobel Prize recipients is surrounded by a highly developed secrecy, a pre-requisite to endow the process with a high degree of objectivity and integrity. Lobbying in matters concerning Nobel Prizes, if at all, may have a negative effect. In 1954, there was an exceptional leak about discussions on the Prize in Physiology or Medicine. The time lag between the discovery and awarding the Prize means that the recipients are frequently well advanced in their career. The age of Nobel laureates at the time of receiving the Prize in Physiology or Medicine varied between 32 and 87 years. Paradoxically, there is a drawback for a young scientist because he/she will not receive any further prizes, as no prize can compete with a Nobel Prize, the most glamorous recognition.

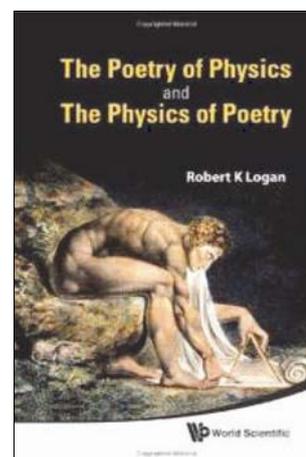
The current volume is presented in eight chapters, ranging from the historical aspects and serendipity in Nobel Prizes to various discoveries grouped into sets of related areas. A large section is devoted to virus diseases, the prions and the like. This bias is understandable since the author, himself is a virologist; besides, a large chunk of Nobel Prizes in Physiology or Medicine has been awarded to the discovery and control of viruses. And many a discovery or Nobel Prize in Chemistry is also closely related to Physiology or Medicine.

The mandate of the Nobel Committee is to try and understand all the advancing frontiers in the fields of biomedical research and related fields of life sciences. One obvious query that comes to the mind is to list out what really are the major components of medicine? Traditionally, medical sciences deals with the

structures and functions of the human body, the diagnosis of medical disorders and injuries, and the treatment of such maladies. Do any of the 'Nobel discoveries' mentioned in the book come close to the level of Andreas Vesalius' 15th century description of human anatomy? At a time when there were no sophisticated, digitalized documentation facilities, Vesalius drew the complete anatomical diagram of man, reconstructed the skeleton from the assembly of bones and accurately redrew the musculature from dissected out corpses. Or are the current discoveries on par with the lucid demonstration of blood circulation by William Harvey? What discovery other than Edward Jenner's introduction of vaccination that ultimately resulted in the eradication of the dreaded small pox from the face of this earth, could have qualified better for the requirement in Nobel's will 'to be of benefit to mankind'. Evidently these discoveries took place much before the establishment of Nobel Prizes, but they remain eternal.

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The Poetry of Physics and The Physics of Poetry. Robert K. Logan. World Scientific Publishing Co. Pte Ltd, 5 Toh Tuck Link, Singapore 596224. 2010. viii + 332 pp. Price: £30.00/US\$ 43.00.

When asked to review this book, I had a feeling of déjà vu. Didn't I read this book 30 years ago under the title *Physics*

for Poets? I also had a vague recollection of the image of Newton and Blake and the poem *Auguries of Innocence*, a poem I have been using for years as the first slide in talks of particle collisions. Upon reading the book, I found that both my responses were right, but outdated! The book is, in fact, Robert Logan's update of his popular classic of the 1970s, *Physics for Poets*. It lives up to the aim of showcasing the 'poetry of physics', but apart from one chapter it does not have much say on the 'physics of poetry'. The 'poet' for Logan, is a person who does not know mathematical jargon, and thus the book aims to explain the beauty of the physical world to 'people who have difficulty with mathematics but wish to understand their physical universe'. The author, who has been teaching a course with the same title as the book at the University of Toronto since 1971 to humanities students, hopes that it will alleviate the alienation from physics that 'poets' (or the humanities student) might have. Given the renewed interest of the public in the new physics unveiled at CERN and with the new telescopes, this book comes at an opportune time. It contains a lot of information on particle physics, cosmology and relativity, in tune with the resurgence of popular interest in these subjects.

The most pleasing aspect of Logan's book is its tolerance of an alternative perspective of science. Instead of being dismissive of alternative, often mythological theories of the creation of the universe (which, I for one have grown to be extremely intolerant of), he patiently explains the basis of validity of scientific hypotheses. Logan claims that just as poets are influenced by ancient myths and civilizations, so are scientists. This is a fact that most scientists do not acknowledge. The pre-European, ancient contribution to scientific thought is well documented in this book, which make the early chapters a pleasure to read. The most interesting creation myth that he has described and certainly one not well-known, is the Assamese myth of Kujam Chantu, which he shows to be somewhat akin to modern theories of cosmology. Logan claims that it is far more cogent and coherent than the Egyptian myths of Knut and the biblical creation myths, in that everything in the universe has a causal explanation. Through exploring this myth, Logan analyses the difference between actual physical theories and

myths and introduces the concepts of falsifiability and the ability to make predictions as the two guidelines that distinguish a mythological theory from a scientific theory. This approach is quite novel. The early contributions of river valley civilizations such as Mesopotamian, Sumerian, Egyptian and Chinese are informatively outlined, but not much mention of the Vedic system of thought is given. As in most Western scientific history books, a lot of emphasis on the Greek contribution to the establishment of modern theories of physics and chemistry is given.

In the first part of the book, the most interesting chapter is the one on the influence of physics on poets who were contemporaries of Newton. In particular, the poems of John Donne, which use scientific analogies for emotion and spirituality are interesting. Goethe's and Blake's poetry, as well as Dryden's work, show that although the scientific ideas of the time influenced poetry and literature, the romantics were somewhat disillusioned by science, thinking it to be 'grey and ashen'. In spite of this, they were still intrigued by the study of science as the opening lines of Blake's *Auguries of Innocence* show. The chapter 'Poetry influenced by the scientific revolution', is indeed an informative and enjoyable chapter.

What this book shows us is that science and the humanities are not different sides of a coin, but are both manifestations of human creativity. The message being conveyed in the book is that just as the beauty of language is expressed in poetry, the physical world has its own language, which is poetic to the scientific mind. The depth of imagination is particularly well illustrated in the later chapters on quantum mechanics and quantum field theory, where the idea of uncertainty and its consequences is introduced. The ideas presented in these chapters are probably the ones that would be the most out of reach to a conventional 'poet'. So, I was intrigued to see how concepts such as antiparticles and quantum electrodynamics could be presented without resorting to mathematical jargon. The chapter on quantum electrodynamics is delightful, although even for a physicist, it requires two readings for the concepts to sink in. The author has attempted to explain 'virtual particles' and the 'action at a distance' concept in layman's language, but I am not sure if a layman

would really understand it as reality. The chapter has a metaphysical aura to it and to concretize it, mathematics is necessary and unavoidable. This is a chapter which most physicists too will find clears a lot of misconceptions, and not only a 'poet' but a science student will probably struggle with the concepts and many readings of this chapter will be required. In an attempt to bring glamour to the subject of relativity, I find that the author has resorted to a bit of hyperbole, and claims such as H. G. Well's time-machine has become a reality, citing the example of the decay of the meson, should be taken with a pinch of salt. Other than that, the chapters on relativity are quite well presented.

One disappointment for many readers of this book, who are constantly confronted by popular articles, TV shows and general hype about string theory, will be the lack of a chapter on string theory. The author acknowledges this, and attributes it to his own personal prejudice. He, as are a number of other scientists, has not yet been convinced that string theory is the 'theory of everything' and it has not met, according to the author, the criterion of falsifiability, which is the cornerstone of his definition of science.

The book ends with a chapter on chaos, nonlinear dynamics and emergent phenomena. Here, in the opinion of the author, the poetry of physics ends, as he concedes that the mysteries of life and intelligence require a knowledge beyond the material universe, which is the realm of physics.

The volume can serve as a good resource book for a course on the scientific method for undergraduate students. It has interesting topics for classroom discussions, activities and projects. It could be supplemented, for classroom use, by Leon Lederman's and Chris Hill's book on *Quantum Physics for Poets*, to offer a good course for both beginning science students and humanities students in integrated programmes. It is also an enjoyable read for practising physicists as it gives a clear discussion of many difficult concepts and will aid them in making physics more accessible to the general public.

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