

GOLDEN JUBILEE OF THE DISCOVERY OF X-RAYS

THE Travancore Medical Association celebrated the Golden Jubilee of the discovery of X-rays on Monday, the 5th November 1945. *Sachivottama* Sir C. P. Ramaswamy Iyer, who presided on the occasion, said: "The whole question of X-rays and all that they mean is a matter which cannot escape the attention of any one who is studying the working of the Universe either from the spiritual or the physical aspects. The X-rays and cosmic rays are the result of the perpetual disintegration that goes on in the Universe which our ancients connoted by the expression *Pralaya*. The emanation that causes the birth of things is action or manifested energy. Matter is now disputed to be not matter at all. The whole world is immaterial, it is *Maya* in the transcendental sense. To our ancients this truth came as part of intuition. The question that comes to most of us is, 'Is vibration and not substance, the ultimate fact of the universe, the *Nadabrahma* of which our ancients spoke?'"

Dr. H. Parameswaran, surveying the progress of "X-rays in Industry", referred to the development of the X-ray technique during the past fifty years and its applications to the identification of precious stones, detection of crimes and examination of minerals and castings.

Dr. C. S. Venkateswaran briefly reviewed the fundamental role of X-rays in physics and chemistry. By the discovery of X-rays, Prof. Röntgen placed in the hands of scientists a radiation having a wavelength less than one-thousandth of the visible light. When a beam of X-rays falls on matter, every atom is covered by a full wave. It may truly be said that the atomic age of which we hear so much to-day was ushered in by the discovery of X-rays. In its wake followed the discovery of the electron, the atomic theory and indeed all the fundamental facts which form the basis of Modern Physics. By the irradiation of matter with X-rays, two things may happen. It may result in the ejection of the outer electrons. The study of these photo-electrons has contributed greatly to the development of the atomic theory. Alternately X-rays may set the electrons of the atoms in vibration; thus every atom becomes a secondary source of radiations. The study of these secondary X-rays helped to investigate not only the number of electrons in an atom but also how they are distributed in space. In the same way, it afforded a deep insight into the arrangement of atoms in molecules and of molecules in condensed media. By far the most extensive field of its application has been to the investigation of the atomic arrangements in crystals, X-rays reveal not only the perfection in the internal architecture of the crystals but also the surface and volume imperfections of even the slightest degree. X-rays thus touch the

heart of matter. These fields of investigations are likely to be extended a hundredfold by the recent improvements in X-ray technique by means of which rays having a wavelength as short as γ -rays could be produced in the laboratory. He also referred to the study of molecular vibrations by X-ray methods—a field full of promise for the future.

Dr. A. O. Jacob dealt with the surgical and therapeutic values of X-rays and the manifold uses to which they are put by medical men for diagnosis and treatment of tumours and eruptions.

Sir C. V. Raman at the outset paid a glowing tribute to Conard William Röntgen, the greatest benefactor of mankind. Speaking of the role of pure science and scientists, Sir Raman said: "Too often to-day the world is separated into pieces by national and international hatreds, antagonisms and war. Science alone among the forces living to-day brings us together. It is the power of man to discover a great truth by intuition that raises him in his own estimation. Thus, for example, it was a supreme triumph of intuition that led Prof. Louis de Broglie to discover the dual nature of matter. Intuition cannot, however, be a substitute to experimentation. Nature reveals her great secrets only to her devout worshippers like Prof. Röntgen. The man of science, like a true devotee, lays his *Atman* at the feet of the deity. Every day and, in fact, every hour, his life is a supreme act of sacrifice.

The greatest leaders of the world, the apostles of humanity, are the men and women like Röntgen and Mme. Curie, who made a free gift of their discoveries to the whole humanity. The true justification of science, if there is any justification, is that it binds the nations of the world together and not separates them and he who forgets this truth is unworthy of the name of scientist.

The discovery of X-rays is an outcome of the supreme courage to do and dare. It heralded a new era of scientific progress. It was a wonderful reward which came to a man seeking in the solitude of his laboratory to understand the secrets of Nature. By this discovery the old world was abolished and a new world ushered in where the hope of mankind was to be brightened and his suffering lessened. It is in fact the one discovery, which produced a thrill in the whole world of science and fired the imagination and enthusiasm of a whole generation of workers. In its biological effects X-rays gave a meaning to what is meant by life. The contributions to physics and chemistry are profound and affected every branch of science. We may regard the modern atomic age as the true child of Röntgen's wonderful discovery fifty years ago."

C. S. VENKATESWARAN.