

PHYSICS

Indian Scientist Awarded Nobel Physics Prize

His Discovery That Light Changes Color When Shining On Transparent Substances Brings Him Honor

THE DISCOVERY that light of a single color, or wavelength, shining on certain transparent substances, is partly changed to other colors is regarded as the greatest accomplishment so far of Sir Chandrasekhara Venkata Raman, Indian scientist of the University of Calcutta, who has just been awarded the Nobel Prize in physics. Named after its discoverer, this phenomenon is now known as the Raman effect, and it was first announced in the spring of 1928.

One of the first scientists, outside of Sir Chandrasekhara's own laboratory, to verify it was Dr. R. W. Wood, of the Johns Hopkins University. Working at the private laboratory of Alfred L. Loomis, Tuexdo Park, N. Y., Prof. Wood considerably improved the original apparatus of the Indian scientist and detected the effect in the summer of 1928.

The Raman effect occurs when monochromatic light (which is light of a single color, or wavelength) shines on transparent substances, such as quartz, chloroform, or water. Generally a mercury arc is used as the light source. The light that is scattered by the transparent material is mostly of the same color as that of the light illuminating it. The spectroscope, the instrument that analyzes light, however, shows that part of this light is changed to wavelengths a little longer or shorter than that of the source. That is, part of the light is either more reddish or more bluish.

On the spectrum photographs, the result is a heavy line, representing the main color, attended on either side by narrower and fainter lines. The fainter lines on one side are arranged the same way as those on the other, except that they are reversed, as if reflected in a mirror, the center heavy line being the mirror. Sir Chandrasekhara, in his first experiments, found only a single and very faint line on the high frequency, or blue, side of the main one; but with the improved apparatus Prof. Wood found groups of nearly equal strength on each side.

The great importance of the discovery came from the fact that the differences between the frequency of the exciting color, used to illuminate the substance, and the frequency of the additional, or Raman, lines are precisely the same as the frequencies of the infrared absorption bands of the same substance. These absorption bands, that is, the bands of color absorbed by the substance with infrared light, or light vibrating too slowly to be seen, are very difficult to determine directly, so the Raman effect is a very convenient means of studying them. Thus it gave a new means of studying the properties of the molecules of these substances, and of the structure of light.

Sir Chandrasekhara was born in India on November 7, 1888, and graduated from the Presidency College in Madras in 1904. In 1907 he joined the Indian Finance Department, and after that held various scientific positions, finally becoming Sir Taraknath Palit professor of physics at Calcutta University and honorary professor at Benares Hindu University. In 1924 he visited the United States, following the meeting of the British Association for the Advancement of Science at Toronto, to attend the



SIR CHANDRASEKHARA VENKATA RAMAN

Professor of physics at the University of Calcutta and discoverer of the Raman effect. He has just been awarded the Nobel prize in physics in recognition of his work.

centenary celebration of the Franklin Institute in Philadelphia. After that he served for a time as research associate at the California Institute of Technology at Pasadena. In the same year he was made a fellow of the Royal Society, the highest British scientific body. He was knighted in 1929.

Science News Letter, November 22, 1930

CHEMISTRY

Honored for Research on Chemistry of Blood

Value of Pure Science Recognized in Award of Nobel Prize To Professor Hans Fischer of Munich, Germany

THE AWARD of the 1930 Nobel Prize in chemistry to Prof. Hans Fischer of Munich, Germany, for his research on human blood is a recognition of the value of what is sometimes called pure science, that is, discoveries or developments which are of great theoretical importance but which may or may not have practical value.

Prof. Fischer's recent noteworthy con-

tribution was the synthesis, or laboratory production, of hemin, which is one of the components of hemoglobin, the red coloring matter of the blood.

Hemin has also been called the respiration ferment, said to rule the organic world. In the higher animals, hemoglobin is a transport agency for oxygen, carrying it from one place to another in the body, but the respiration