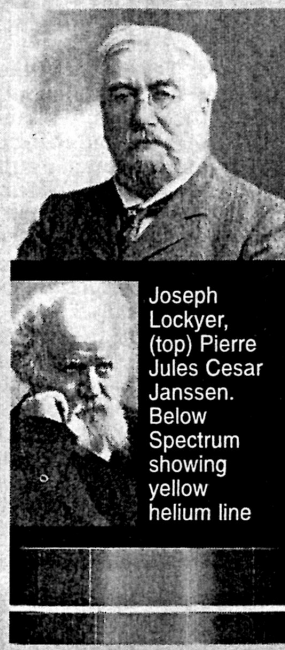
The Discovery of Helium

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Helium is known as an inert gas whose atoms are, after hydrogen, the second lightest amongst all chemical elements. Helium is also believed to be the second most abundant element in the universe. But in terms of discovery by man, the element is not all that old. And more interestingly, it was first discovered in the cosmos rather than in a terrestrial laboratory.



Indeed, in terms of location, India can claim some credit for the discovery. It was on August 18, 1868, at Guntur in the present Andhra Pradesh that the discovery took place. Alas, no Indian can be credited with the finding, though. Pierre Jules Cesar Janssen, a French astronomer was in India to observe a total solar eclipse that was taking place that day and was visible from Guntur. During the eclipse, the bright disc of the Sun is hidden behind the Moon and it becomes possible to study the Sun's outer parts. Janssen was interested in the spectrum of the chromosphere, a colourful layer of atmosphere surrounding the Sun. In his spectrum he was surprised to see a bright yellow spectral line at a wavelength of 587.49 nanometres.



Joseph Lockyer, (top) Pierre Jules Cesar Janssen. Below Spectrum showing yellow helium line

A spectrum is ordinarily what you get when you pass sunlight through a prism and separate the white light into the seven colours. In this case, the light came not from the solar disc but from the chromosphere. And the bright line signified that there was an excited layer of atoms that was emitting radiation of that precise frequency. Such cases of excited atoms giving bright lines were known before and these lines could be identified with known atoms. The wavelength at which Janssen found the line was new, however, and it suggested that a new element was present.

The line was strong enough to be seen even outside of the eclipse; that is it could be detected even when the Sun was shining brightly. Thus it was that on October 20, 1868, the English astronomer Joseph Norman Lockyer observed the same yellow line in the Sun's spectrum. Lockyer and his colleague the chemist Edward Frankland also from England realised that this was coming from a new element and named that element Helium, after the Greek name for the Sun, Helios.

Both Janssen and Lockyer are credited with the discovery of Helium. The classification of known elements according to their chemical properties had led Dmitri Mendeleev to the periodic table of chemical elements. This table had a gap at element of atomic number 2, after hydrogen at atomic number 1. Helium filled that gap. It took several years before helium was isolated in a laboratory experiment. The credit for this work goes to William Ramsay who accomplished the task in 1895.

Next week: Why is Pluto not a Planet?