

the world's development links the work of one man with that of another. For the Welsbach mantle would never have existed but for the *apparently* less important invention by Bunsen of the burner (or more correctly, the principle) which still bears his name.

Chapter six would give us the birth of the Tantalum lamp, the general development of electric lighting, of the introduction of the Nernst lamp, the enclosed arc lamp, the flame lamp,—all very important developments. But history has now attained an accelerated speed and much which previously would have been considered important is now hidden in the deepest obscurity. Developments follow each other too rapidly to notice any but the very most important. There is the Mercury arc, the Moore tube, the Cooper Hewitt tube, and other devices. But all are eclipsed by the Tungsten lamp, whose wonderful development brings us up to the present day.

The article would be incomplete, however, without the seventh and last chapter reviewing the growth of the very study that the present paper has to introduce—Scientific Illumination.

So much then for the paper which *might* have been; so much for the attempts to find satisfactory "artificial light" so-called. When that paper is written, we will go into that matter further. For the present we will simply take it that we have got so far, and having so many available light sources, we want to know a little more about the best ways of using some of them so as to produce the best results. To this end we will confine our attention for the limited time at our disposal to consideration of a few points about the laws and characteristics of light, the structure and operations of the human eye, and the measurement and control of light and its distribution.

It is not possible to say what light really is, beyond stating that it is one of the great forces of nature, our knowledge being confined chiefly to its phenomena and the laws by which these are produced. Various theories have from time to time been put forward as to the mode by which light passes from one object to another or to the human eye, thus enabling us to see, two of which only are worth consideration. One of these is known as the "emission" theory, according to which small particles are emitted from the article seen; these are supposed to strike upon the eye and cause the sensation of vision. The other is known as the "undulation" theory. According to this all bodies and all space are pervaded by a thin and elastic fluid called ether; that light (or rather, vision) is caused by a vibratory or undulating motion imparted to this substance; that these tiny waves or undulations produce the sense of sight when they strike the nerves of the eye as do sound waves when they