

The old idea that the act of vision depends on the occurrence of certain photo-chemical changes in the retina is now no longer a matter of theory, but has been shown to be correct by the observation of a series of very definite and easily demonstrable facts, and there can be no doubt that there exists in the living retina a red colouring matter, which is transformed by the action of light into several other substances.

It might at first thought excite surprise that the red colour of the retina has so long escaped the observation of physiologists ; not so, however, when we take into consideration that the colour is constantly being destroyed during life, and that it disappears altogether very soon after death if the eye is exposed to the influence of day-light.

Kühne of Heidelberg, in some further experiments discovered that the colour was retained from forty to sixty times longer after death if the eye was only exposed to gaslight, and that in the dark, or when exposed to a sodium light, it was retained until decomposition set in. The retina, when removed from the eye, and bleached by the action of light, does not resume its red colour when kept in the dark ; if however, it is only lifted up from the subjacent epithelium, and bleached, the colour is restored by replacing it in contact with the epithelium and keeping in the dark ; hence it is probable that the power of restoring the red colour belongs to the retinal epithelium. In view of the facts recorded above, Kühne* was led to believe that by arresting the constant reproduction of red colour, which takes place during life, a more or less permanent objective image might be formed upon the retina, and his experiments in this direction have justified the assumption. The head and eye of a rabbit were fixed at a distance of 1.5 m. from a hole 30 c. m. square in a window shutter, covered five minutes with a black cloth, and then exposed for three minutes to the light from the hole. The animal was then decapitated, the eye enucleated as quickly as possible by sodium light, opened, and placed without delay in a 5 per cent solution of alum. Two minutes after death the other eye was exposed to the light and treated in a similar manner, except that it was not.

* Centralblatt f. d. Med. Wissenschaften, 3, 1877.