

The sea on dark nights is lighted up under the strokes of oars, in the track of boats and ships, along the shores, and among the breakers, and it is known that this attractive phenomenon is chiefly due to myriads of *Noctiluca*, *Peridinia*, and other small pelagic forms; yet these organisms emit a momentary splendour only when they are disturbed by an extraneous body or by the mechanical action of the waves, although the highly specialised apparatus in *Nyctiphanes norvegica*¹ is apparently an evidence that in some animals this power is under the influence of the will. Mr. Murray also informs me that he has observed very many animals emit phosphorescent light in the stillest waters without any apparent external stimulant.

Granting that the phosphorescence of abyssal animals is a normal characteristic, it must still be proved that it is not only sufficient to dispel the darkness so effectively as to explain the presence and development of visual organs, but that it is capable of so great actinic action as to determine the vivid colouration above referred to.

Just as the bathymetrical limit of marine life, which was laid down at 300 fathoms by Professor Edward Forbes, is now no longer accepted, so the distance to which light can penetrate may prove to have been understated hitherto, and should, in the interest of truth, be re-examined by physicists.

It is stated that in the passage of light through sea water the first rays to be absorbed are the calorific, then the luminous, and lastly the actinic or chemical, which are precisely those that have most influence on colours and on chlorophyll and consequently on vegetation in general, and attempts have been made to fix the limit of the penetration of light by observing the gradual descent of a white object, and by noting the moment when that object could no longer be discerned. But even although the distance thus obtained be more than doubled, and the observer placed in a condition to be in no way influenced by the external light, such observations are not very reliable.

Since several indications of the influence of light in marine abysses now exist, an explanation of the manner in which it can penetrate to even very great depths should be sought after.

An interesting observation may here be noticed. When two French aeronauts were recently crossing the English Channel, and when at a great height above its surface, they were struck by the circumstance that its bed could be distinctly seen, and that all the details of the irregularities of its bottom could be traced. It may be said that the depth of this narrow belt of water is not to be compared to that of the great oceans, but assuredly even its depth could not be *seen* by an observer near the surface, and perhaps it is not less than the limit hitherto placed on the distance to which light can penetrate.

¹ Narr. Chall. Exp., vol. i. p. 743.