

distance of a few hundred yards, a distance so short that no vessel could get the warning of the light in time to be saved from disaster; consequently it is doubtful if the aim of the inventors of these extraordinarily powerful lights, to secure greater penetration in thick weather, is attained: on the other hand, a very brilliant light in clear weather is a distinct disadvantage, blinding the sailor, and preventing him from judging his distance either from the light or from neighbouring object.

I believe that the immense sum spent in the maintenance of extraordinarily powerful lights would be utilized to better advantage in increasing the number and power of fog alarms in the same district.

Improvements in the illumination of lighthouses have been forced upon engineers by the growth in the size and speed of vessels. In the days of the old sailing ships, when shore lights were few and feeble, a powerful fixed light was a sufficient guide. In these days of 23-knot vessels, running through narrow, and often through dredged channels, when every city and small town is illuminated by electric light, the fixed light, that was so brilliant under old conditions, is rendered insignificant by comparison, and it becomes necessary to provide a beacon more powerful, and one that by its character can be recognized as soon as seen. The head lights of electrically lighted steamships are to-day as brilliant as many of the old fixed lights; this is another reason why it has been found necessary to adopt the principle of abolishing fixed lights altogether for the more important stations.

To the improvement in lamps I have already referred; the improvement in optical apparatus has been in the direction of varying the character of the light, either by occulting it, or by gathering rays into condensed beams by a suitable arrangement of lenses, thus giving a very powerful flash or groups of flashes followed by an eclipse. This flashing light can be very much diversified in character, but a description of the methods of attaining the results would be tedious if described technically.