
Matching Colours by Artificial Illumination.

—By Arthur R. Riddle.—

Every student of Natural History must, at some time or other, have regretted the shortcomings of most artificial illuminants, in that they failed to adequately show up the colours existent in specimens. Whilst the trouble has been mitigated to some extent with each advance in artificial lighting, one could not until recently make a colour comparison of extreme accu-

racy by their aid. Colours matched by artificial illumination were found to be not quite accurate when daylight was brought to bear on them. The response to industrial necessity has now given us a source of illumination, which is wonderfully near daylight. Due chiefly to intensive industrial work, stimulated by war needs, a demand existed for an artificial source of illumination which would approximate daylight in so far as its radiation was concerned. This was felt especially in the textile industry, and wherever colour had to be matched. The Research Laboratories of the largest electric lamp concern in America, took up the problem, and the Mazda C-2 lamp was the sequel. Certain structural modifications were made, but the chief factor is the bluish glass which has been used. This was selected after close research in order to provide a filtering medium, such that the spectrum of the filtered radiation would closely approximate the spectrum of solar radiation. For all work where colour is concerned, the lamp has proved to be ideal. It is an interesting experiment to take lamps representative of the various milestones in the evolution of electric lighting, and wire them up so as to make them immediately ready for comparison. Take the following four lamps—

Carbon Filament Lamp.

Vacuum type Metal Filament Lamp.

Mazda C gas-filled Metal Filament Lamp—commonly called $\frac{1}{2}$ -watt type.

Mazda C2 gas-filled Metal Filament Lamp—commonly called the "Blue Glass" or "Daylight Lamp."

The radiation from the Carbon Filament Lamp appears fairly white when it is the only source of illumination. It instantly assumes a reddish-yellow tinge when the vacuum lamp is switched on. This lamp in turn appears yellow by comparison with the $\frac{1}{2}$ -watt type, which is very brilliantly white, but even the $\frac{1}{2}$ -watt type suffers by comparison with the type C2. By comparing the first and last lamps, one can hardly believe that the radiation from the former ever did appear white. Whilst the ordinary $\frac{1}{2}$ -watt type is a great advance on previously existing types, and gives a radiation approximating very closely to the ideal, the C2 lamp goes further, and stops little short of perfection.

As concerning current consumption. One can say roughly, avoiding technicalities essential to accuracy, that for equal candle powers, the ordinary metal filament lamp takes only one fourth of the current used by the carbon filament lamp. Simi-

larly, the $\frac{1}{2}$ -watt and daylight types of lamps take only about one half of the current used by the metal filament vacuum lamp. The sales of both the Mazda lamps are controlled by the Australian General Electric Company.
