

spectrograph to obtain satisfactory negatives of the various species of fire-flies. The photographing was done in a dark room. Over 150 negatives were taken, over 56 hours being spent in holding the insects in place. The plates, being sensitive to red light, were developed and fixed in a perfectly dark room. The numerous details in the work will be published in the complete paper.

Prints from negatives of the light of *Photuris pennsylvanica* and of *Photinus pyralis* are given in fig. 23, from which it is evident that the light of the *Photinus pyralis* does not extend so far into the blue ($\lambda = .5015\mu$)

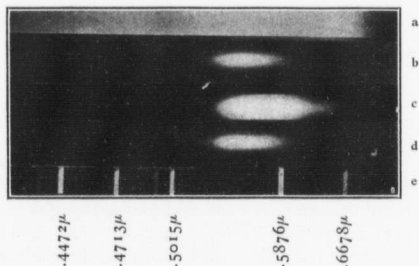


FIG. 23.—a, spectrum of "4 Watt" carbon glow lamp; b and d, spectrum of fire-fly, *Photinus pyralis*; c, spectrum of fire-fly, *Photuris pennsylvanica*; d, helium vacuum tube spectrum, used for comparison.

as, and that it extends farther toward the red ($\lambda = .6678\mu$) than does the light of the *Photuris pennsylvanica*.

In addition to the negatives of the fire-fly light, a series of photographs (see fig. 23), were obtained of the spectrum of a standard comparison lamp (carbon glow lamp operated on four watts per candle) when exposed for 2, 4, 6, 8, 12, 20, 30, 60, 120 and 240 seconds.

The "densities" or "blackening" of the photographic plates were then measured by means of a Marten's polarization photometer, mounted on a small comparator, in such a manner that strips 1.5 high and 1 mm. long were compared against the clear unexposed plate. These "densities," i.e., the amount of light absorbed, were then plotted to scale, as indicated in