same as for 14 adequately studied nonluxotonic units (7/s, range 1–18/s). The luxotonic units which discharge faster in the light were slightly more numerous than those with a higher rate in the dark (~60:40; Table 1), but there was otherwise nothing to distinguish these two types of unit.

It is of particular interest that about 20% of the luxotonic units were also directionally sensitive to moving lines. In such cases a restricted receptive field could be defined usually within the area of the fovea. The percentage of luxotonic units encountered in the foveal representation was not significantly different from that in calcarine cortex ($P < 0.05$).

Comparing luxotonic and nonluxotonic units, i.e., all units responding to some form of photic stimulation but not meeting the definition of luxotonic, there was a statistically significant difference in the number having a restricted receptive field (identified by small flashing or moving stimuli), 52% versus 70%, respectively. (In each category 4% were not tested.) The nonluxotonic units lacking well-defined receptive fields were those responding transiently to diffuse illumination and/or to the strobotron.

The luxotonic units for which restricted fields could not be found were examined extensively, not only with the usual stimuli for plotting such fields, but by other means. For instance, for the unit in Fig. 11, occluding up to three-fourths of any part of the 56 x 80° projection screen had no effect, and only when a greater percentage, again including any part of the screen, was occluded, did the rate of discharge begin to diminish. For several units a spot of light a few degrees in diameter coming on any place on the 56 x 80° screen could alter the rate of discharge, but no point could be found where a shadow of comparable size had any effect. While such phenomena immediately suggest the possibility of scattered light, the presence of small, sharply definable fields for other units in the same animals make such an explanation somewhat less plausible in accounting for the observed diffuseness of receptive fields for many of the luxotonic units. This thesis was also supported by observations on a luxotonic unit which discharged at 24/s in the light, 4/s in the dark, and had a well-defined receptive field of 13 deg^2. More than half this receptive field could be shadowed from any direction without decreasing the firing frequency, yet a 0.2° spot of light placed outside the receptive field had no effect and within the receptive field produced a brisk response. The sharp boundary of this field suggests that light scattering is not the only reason that light falling on any small portion of the field of a luxotonic unit is able to sustain an effect equivalent to lighting the whole field.

As can be seen from Figs. 9*A*, 10, 11, and 12, the rate and degree of adaptation displayed by luxotonic units is variable. However, in some cases the stability and reproducibility of a given rate, once adaptation was complete (if it occurred at all), is remarkable. Several units were followed in steady light for 1 h and manifested no change in overall rate of discharge. One unit, for instance, maintained an average rate of 55/s under these undisturbed conditions, but the range of rates for 5-s samples was 22–102/s. Obviously the stability is apparent only in samples of relatively long duration and if the condition of the animal is also stable. Further examples can be seen in Figs. 10, 11, and 12*A* and *C*. Note that at the end of the record in Fig. 10 the rate for 70 cd/m^2 approaches the same level as it did for this luminance roughly 15 min earlier, although premature termination of the recording introduces some uncertainty as to whether this rate had fully stabilized.

The adaptation observed in Figs. 10, 11*A* and *B*, and 12*A* and *B* is in the nature of "light adaptation." Thus, for the on-type unit (Fig. 11) the rate falls gradually after an increase in the light, whereas for the off-type units (Figs. 10, 12) the rate gradually rises. On the other hand, the off-type can show a gradual fall to a lower rate after onset of darkness, suggesting a mechanism of "dark adaptation" (Fig. 12*C*). The converse was true of on-type units.

The rather rapid time course of adaptation, usually not > 1–3 min, is consistent with a cone mechanism. Even more suggestive of the possibility that luxotonic units are influenced primarily by cones is