

surements (microdrive and histology) of depth of penetration of the microelectrode, as well as position of the receptive fields (which fully confirmed Cowey), we estimate that all but 10% of the 239 units examined in this study lay within the foveal representation. The nonfoveal 10% are designated as "calcarine" units. Analysis of waveforms and spike durations (median: 0.65 ms for the biphasic complex), as well as characteristics of the receptive fields, strongly suggests that the microelectrodes did not record from fibers or presynaptic terminals from the lateral geniculate nucleus (LGN).

A type of unit was tentatively identified as being characteristic of the upper 100–200 μm of the cortex. They displayed an irregular background activity (2–10/s), were always of small amplitude (ca. 70 μV), and no visual stimulus could be found to affect these cells. Similarly unresponsive, superficially located cells have been noted by Wurtz (44) and Stone and Dreher (42). For stimulation of OR, two of these units responded only after 15–20 ms, and another fired three spikes, at 6, 9.5, and 14–16 ms, respectively. The latter unit, however, responded within 5 ms for stimulation of OT and within 2 ms for stimulation of another locus in OR.

This was the only type of unit encountered in the most superficial cortex and constituted about half of the 27 units, in the population of 121 tested (22%; Table 1), which remained unaffected by any of the visual stimuli employed. Aside from these units in superficial cortex, no type of response (or lack of it) appeared to be characteristic of or limited to any particular layer of the cortex.

CLASSIFICATION OF UNITS—RECEPTIVE FIELDS. In essentially all cases each unit was held for longer than 20 min, and none are included which showed any sign of injury at or immediately after classification as per Table 1 or for which there was doubt as to their individuality. In the initial, exploratory stages of the experiment no set sequence was followed in presenting the various stimuli. Between this and the vagaries of losing the unit prior to completion of the analysis, not all units were

tested with all the stimuli listed in Table 1. In the later stages of the experiment a fixed sequence of testing was followed: waveform, amplitude, and duration were measured to be certain the same unit was present throughout the analysis. Rate of discharge for 1 min in diffuse light (280 or 680 cd/m^2) flooding the entire $56 \times 80^\circ$ projection screen, and for 1 min in darkness, was recorded to determine whether the unit was "luxotonic" (see below) or "transient," or failed to respond to steady diffuse illumination. For transient units, full field flashing at 0.2 Hz, 50:50 light-dark ratio, afforded further classification (Table 1). Response was then tested to electrical stimulation of OT and/or OR and stroboscopic flashes. The receptive field was then plotted if possible, the response to movement examined, and further analyses made depending on the nature of the unit.

For plotting the receptive field, the general region of interest was either known from field location of preceding units, from retinoscopy, or else could usually be identified initially by moving stimuli. This region was carefully explored with spots 0.2 and 1.0° in diameter flashing at 0.3–1 Hz, 50:50 light-dark ratio. With such stationary, flashing spots it was possible to demonstrate well-demarcated receptive fields in only 38% of the 185 units tested (Table 1). These units, of course, also responded to moving stimuli. Receptive fields could be defined for a further 50 units (27%) only by using small spots and bars undergoing continual, small oscillation in position, e.g., a 0.2° spot oscillating 1° at 5°/s. (For nine units responding to movement the receptive-field boundaries were considered to be too indistinct for inclusion in Table 1, or tests were not completed.) By either method of plotting, the fields were usually elliptical rather than circular and were often of irregular contour. For 102 units the field size ranged from 0.2 to 219 deg^2 , the distribution of field areas being relatively flat from 0.4 to 8 deg^2 , and skewed toward the larger areas (mode 4 deg^2 , median 6.6 deg^2). Consistent with the findings of Jacobs and Yolton (29) on the lateral geniculate nucleus, there was no significant relation between location