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TEMPORAL LOBE CELLS OF THE MONKEY WITH VISUAL RESPONSES SELECTIVE FOR FACES.

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While recording from visual cells in the temporal lobe, we have observed a small number of cells which responded strongly to faces. Analysis of the responses of 50 such neurones in the vicinity of the fundus of the superior temporal sulcus in 3 hemispheres of 2 alert rhesus monkeys showed the following. (1) All fifty neurones responded to faces (which were human or rhesus monkey, 3-D or projected, and shown to the monkey through a large-aperture shutter with visual fixation monitored), and were almost unresponsive to gratings, simple geometrical, and other complex 3-D visual stimuli. (2) The neuronal responses to the sight of a face were sustained and had latencies of 110±20ms. (3) 32 neurones responded also to some arousing or aversive visual stimuli. (4) 18 neurones responded selectively to faces, and had the following properties. (5) These neurones were in general unresponsive to auditory or tactile stimulation which was aversive, or arousing as shown by the GSR, or to stimuli such as a hand which signified a human or monkey. (6) Masking out, or presenting isolated parts of faces showed that some cells responded on the basis of different features. Some required eyes, some hair, some the mouth, and others showed parallel responses to each of a number of features. (7) Some cells responded more strongly when such component features of faces were combined. (8) Presenting the face in profile failed to elicit a response for some cells. (9) Transformations of the face such as isomorphic rotation, or alterations of colour, size or distance, did not greatly affect the magnitude of the neuronal responses. This evidence suggests that in the temporal lobe of the primate there are neurones specialised to respond to the component visual features present in faces.