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Psychological Deficits Associated with Frontal Lobe Lesions

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Defects following injury to the frontal lobes have traditionally been sought in the highest intellectual operations of the human mind, and in some cases have indeed been found^{1, 2, 4, 5, 10}. But in many others they undoubtedly have not^{13, 27}. The reasons for this inconsistency are many and varied. The age at which the patient sustains his brain damage is undoubtedly one factor, though its precise significance is far from easy to assess^{24, 28}. Another may well be the extent to which actual loss of cerebral tissue is complicated by more extensive neurophysiological dysfunction^{6, 13}. Then, too, methodological snags of all kinds abound. Teuber²⁷ has recently reminded us of the hazards inherent in the study of single cases and the no less serious—if less widely recognised—hazards that arise in the study of groups of cases. But even when we make every allowance for such hazards, it still cannot be said that any clear and consistent effect of frontal lobe damage upon intellectual performance has as yet been convincingly demonstrated.

I do not wish in this paper to review earlier studies of frontal lobe defects or to present new material on any scale. My aim is simply to draw attention to certain issues raised by earlier workers and to suggest some fresh lines of inquiry. As Teuber (1964) has urged, quite new approaches will be necessary if we are to clear up the many contradictions generated by earlier

inquiries. If we can but find the right questions to ask, I cannot believe that the study of frontal lobe function will prove as unrewarding in the future as it has in the past.

The frontal lobes and cerebral dominance

The first question I would like to ask is concerned with cerebral dominance. Ever since Jefferson¹⁵ claimed to show that intelligence and personality are affected no more adversely by removal of the left than of the right frontal lobe, it has been tacitly assumed that the prefrontal areas are not subject to cerebral dominance.

Jefferson's claim derived considerable support from the careful work of Rylander²⁵, who showed that measurable intellectual defect after operation on the frontal lobes is no more severe after left-sided than after right-sided excisions. While accepting this evidence, I must admit that I have always found inferences drawn from it with regard to the equipotentiality of the prefrontal areas vaguely unsatisfactory. If, as most people believe, cerebral dominance involves a genuine functional asymmetry, it is difficult to accept that it involves only *part* of a cerebral hemisphere and does not extend to the whole of it. Furthermore, even if no inherent superiority can be ascribed to the left frontal lobe, the very fact that it forms part of the dominant hemisphere must surely affect in