

treated corn grains. Exposure for 144 minutes increased the intensity of the reaction.

The embryos of soaked barley grains exposed to X-rays for one, two, four and eight minutes showed an increase in the intensity of color in the one-minute exposure with a change in the quality, and decreased intensity of color in the two- and four-minute exposures. The eight-minute exposure showed a very faint pink color.

Attempts were made to find a method for a quantitative determination of reduced glutathione in the higher plant tissues. Tunnicliffe's² quantitative method was tried with yeast with results somewhat lower than those obtained by him. The same method was applied to the tissues of higher plants, but the attempts were unsuccessful because of the writer's inability to eliminate the pigments and at the same time retain the substance which reacts with nitroprusside.

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ON THE RECOVERY FOLLOWING LESIONS IN THE CEREBRAL CORTEX

THE recovery of functions following lesions in the cerebral cortex is a common "observation" which has received little or no thorough study. In the literature on this subject that was accumulated during the World War, Hollander has found numerous cases in which the patient, after having lost large quantities of nervous tissue, is said to have "entirely recovered his mental faculties." In many cases the patient demonstrated this complete recovery by sticking out his tongue and walking across the room when told to do so by the attending physician. Obviously a little more testing is necessary before we shall care to place much confidence in such reports.

In the work with experimental lesions the same error has been not quite so obvious. Complete recovery of function has been reported to be found in experimental animals when there have been either no tests at all, or only tests of gross movements such as locomotion. Employing such methods, the major question is, "How great a lesion may be made without producing loss of function?"

If adequate tests are used, if those reactions are tested which the animal finds difficult to make, the interest undergoes a reversal. The question now becomes, "How small a lesion may be made in the cortex and still produce a measurable loss in the animal's reaction capacity?"

In our investigations we are employing cats. The animals are tested before and after the operations on such situations as climbing a vertical screen, to which they hold with three paws while they stretch for food

with the fourth; high jumping; climbing a vertical ladder; crawling through small holes; jumping up to catch a rope and hanging there by the forepaws while the food is captured by the head; stretching down from a platform; walking across a narrow bar on which there are obstructions; reaching through a small hole at various angles in both the vertical and horizontal planes; removing a bag from the head, and a few others of a similar caliber.

The potentialities of such an attack may be illustrated by some of the results obtained on three animals.

We removed from the parietal region of No. 32 an amount of tissue which we judged to be about equal to all that forward of the cruciate fissure. Six weeks after the operation our tests could reveal no loss of motor reactions. In the tests made before the operation No. 34 used his left forepaw much more often than he used the right. A lesion about a quarter inch wide and three eighths inch deep was made in the arm area of the right motor cortex. No tissue was removed. Six weeks later the animal was completely right handed. In those situations which demand skillful use of the left forepaw to obtain food the animal goes hungry. All the tissue forward of the cruciate fissure was removed from No. 35. Six weeks later the animal was unable to perform any of the required reactions.

It is interesting to note that at the time of the second test all these cats were "normal" to a casual observer.

There is little evidence here that there is "segmental localization," "equipotentiality of the cortex," "vicarious assumption of function," or that the "brain acts as a whole." Our work, so far, has produced results which indicate that there is organization in the central nervous system. In any organization certain parts have certain functions.

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BOOKS RECEIVED

- BLUNT, KATHARINE, and RUTH COWAN. *Ultraviolet Light and Vitamin D in Nutrition*. Pp. xiii + 229. 21 tables. 39 figures. University of Chicago Press. \$2.50.
- THOM, BURTON PETER. *Dust to Life*. Pp. xv + 409. Illustrated. Dutton. \$5.00.
- THOMAS, MILTON H., and HERBERT W. SCHNEIDER. *A Bibliography of John Dewey*. Pp. xxi + 151. Columbia University Press. \$3.00.
- Transactions of the Fourth International Congress of Entomology*. Volume II. Edited by K. Jordan and W. Horn. Pp. vii + 1037. 12 plates. 183 figures, diagrams and maps. Gottfr. Pätz, Naumburg A/SAALE, Wenzelsring 5. \$10.00.
- Transactions of the National Safety Council: Eighteenth Annual Safety Congress*. Volume I. Pp. 264. The National Safety Council.