THE BRAIN

The Brain as an Organ. By FREDERIC WERTHAM, M.D., and FLORENCE WERTHAM, with introduction by Adolf Meyer, M.D. Published by the Macmillan Company, New York, 1934; 538 pages, 166 plates. Price, $7.50.

THIS is a thick and comprehensive book, but it is diffuse and confusing. The author preaches a sermon, but like many sermons it is too long, too repetitive and the reader is too conscious of the feelings of the preacher. Exhortation, timely though it may be, does not mix well with science. Even the title of the book carries a little reproof, as if really the reader ought to have known that the brain is an organ (but some of us unregenerates still prefer to consider the brain as an association of many organs). In the author's own words: "The brain as an object of histopathological study is also an organ of the body like any other, and not something unique, to be measured by entirely different standards. . . . To blend neuropathology more and more with a biologically oriented general pathology will be the task of the future—a task which we hope this book will further." This is from Chapter I, which is a good lecture. Just what connection this has with the next 114 pages is hard to see, for these are taken up with a summary of the methods of neuropathology. The last 370 pages comprise a discussion of cerebral lesions, under the chapter headings: "Alterations of the Individual Components of the Nervous Tissue," "Kinds of Lesions," "Distribution of Lesions," "The Extent of the Normal," "The Interpretation of Lesions," "Correlation of Lesions with Psychopathological Phenomena," "Comparative Histopathology," "Some Histopathological Syndromes that may be Associated with Mental Disorder," "Is There a Histopathology of Schizophrenia," and "Forensic Neurohistology." These are all interestingly written, and show the author's industrious reading in a brave attempt "to present correctly the whole range of the fundamental data of the histopathology of the brain." The best parts of the book are the chapters on "Kinds of Lesions," where it is emphasized that "the stage in which a lesion is examined deserves the center of interest," and the discussion of "Distribution of Lesions." At the end of the book are inserted 166 excellent illustrations. The index is meticulous to a fault, *e.g.,* referring the reader too often to unimportant and incidental remarks about a subject.

This is an arresting book, written with a missionary spirit and compelling attention from neurologists and psychiatrists, although one may disagree with many of the statements and wish that the scientific exposition had been separated from the expressions of opinion.

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SPECIAL ARTICLES

VIABILITY OF B. COLI EXPOSED TO ULTRA-VIOLET RADIATION IN AIR

WHEN a liquid suspension of microorganisms is atomized into the air, the infected droplets so produced will evaporate rapidly and there will be left adrift in the air infected nuclei that may remain suspended for protracted periods of time and be carried appreciable distances by air currents. Since, under the conditions of existence thus created, many microorganisms appear to retain their viability for a number of hours, the influence upon viability created by environmental factors, including physical and chemical agents, becomes of interest.[1]

During the past winter, a number of such factors and agents were submitted to experiment in a preliminary survey of their significance. The most interesting one studied was ultra-violet light, for which a few of the results of four types of tests are presented herewith. In all the tests reported a diluted broth culture of *B. coli* was atomized into a room of about 2,000 cubic feet capacity. Samples of air were then withdrawn from the room through a Wells centrifuge[2] and the number of *B. coli* in 10 cubic feet of air determined. A 500-watt quartz mercury-vapor electric lamp served as the source of ultra-violet light.

In the first type of test, one half of a diluted broth culture of *B. coli* was atomized into the darkened room; the other half into the room when lighted by the lamp. The test organism was recovered from 10 cubic feet of room air as shown in Table 1. The

TABLE 1

Elapsed minutes	0	30	60	90	120
B. coli recovered from					
darkened room	5,200	560	140	42	3
lighted room	0	0	0	0	0

reduction of organisms in the darkened room is characteristic of the normal disappearance of *B. coli* from

[1] *Amer. Jour. of Hygiene,* 20: 3, 611–627, November, 1934.

[2] *Amer. Jour. of Public Health,* XXIII: 1, January, 1933.

the air. The influence of ultra-violet radiation is evident.

In the second type of test, the lamp was energized in the midst of an experimental run with the results given in Table 2. It should be noted in this connection

TABLE 2

Elapsed minutes	0	16	30	42	57	72	87
B. coli recovered	9,500	2,500	890	1	0	0	0
Condition of lamp	off	off	off	on	on	on	on

that maximum emission of ultra-violet radiation was not reached for several minutes after the lamp employed was first energized.

In the third type of test, the lamp was lighted but completely covered, leaving the room in darkness except for a brief period of time. A four-minute exposure of the room to light yielded the results given in Table 3.

TABLE 3

Elapsed minutes	0	15	30	45	60
B. coli recovered	4,300	890	0	1	0
Condition of lamp	covered	covered	*	off	off

* Lamp uncovered for 4 minutes prior to sampling.

In the fourth type of test (Table 4), the room air was irradiated for half an hour prior to inoculation of the darkened room with *B. coli*. This was done to determine the possibly masked effect of ozone and ions released by the lamp.

TABLE 4

Elapsed minutes	0	15	30	45	60
B. coli recovered	5,700	1,750	810	625	119

It should be apparent from these tests that the destructive power of ultra-violet light of itself is of a higher order of magnitude in air than in liquids or other environments not highly transparent to ultra-violet radiations.[3]

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STERILIZATION OF TRIBOLIUM BY HIGH TEMPERATURE[1]

IN order to obtain adult *Tribolium confusum* for experimental purposes some 500 eggs were recently placed in an incubator so that they might develop at a constant temperature of 28° C. As development proceeds and the pupal stage is reached the individuals are sexed: this is a necessary step, since the sex of *Tribolium* imagoes can not be determined by superficial characters. During the metamorphosis of these particular beetles, however, an accident inadvertently occurred to the incubator, which caused the temperature to rise from 28° C. to 39° C., in a period of about five hours. These temperature and time relationships were substantiated by a thermograph in the incubator. The *Tribolium,* at the time of this accident, had reached about the median of their metamorphosis. There are typically 7 or 8 larval instars in development, and most of these individuals were in the third and fourth larval stadium. Upon the discovery of this high temperature the larvae were immediately removed from the incubator and examined. It was obvious that the heat had increased their activity, since they were wriggling in the flour considerably more than is typical. As the temperature quickly sank, however, the larvae, to all intents and purposes, assumed their normal behavior. Not a single individual was killed outright by the heat. Since all the larvae seemed unaffected by their experience they were returned to another incubator and kept at 28° C. for the remainder of their metamorphosis. As pupae were formed they were sexed and isolated into male and female containers. The pupae emerged into imagoes without atypical mortality. A similar series of eggs from the same parental source had been placed previously in another incubator at 28° C., which fortunately maintained that temperature properly for the entire period of metamorphosis. This latter series furnishes a control for the former. Matings were made up of the "heated" *Tribolium* as follows: 50 bottles, each bottle containing 32 gm of flour and two pairs of *Tribolium confusum.* Every five days the flour of each bottle was sifted and examined for eggs. At the first five-day count only one bottle out of the 50 showed any egg production: this bottle produced three eggs. At the 10-day count the same bottle, again producing only three eggs, was the only productive one. No eggs were produced in any of the bottles for the fifteenth and twentieth day counts. The twenty-fifth day saw three bottles producing 18 eggs. Comparable experiments set up with the *Tribolium* reared at a constant 28° C. showed no such aborted fecundity. Here, for example, 30 of the 50 bottles were productive the first five days and yielded 305 eggs. The tenth day reading found 38 of the bottles productive with an egg count of 411. These data appear to be clear-cut evidence for the sterilization of *Tribolium* by high temperatures. The "heated" beetles seemed "normal" in every way as far as their activity was concerned. About 60 per cent. of the

[3] *Jour. Amer. Water Works Assn.*, VII: 3, 327–342, May, 1920.

[1] From the Department of Biology, School of Hygiene and Public Health, the Johns Hopkins University.