

cooled in a dish of ice water. It is then placed in the boiling water bath for 2 minutes and immediately cooled in ice water, after which 3 drops of 5 per cent. solution of guaiacol are added. With pure lactic acid solutions a rose color is developed which remains stable and clear for some time. The maximum color is developed in the blood filtrates in about 20 minutes and it must then be read against standards prepared with known amounts of lactic acid (conveniently prepared from zinc or lithium lactate). An appreciable color is produced by 0.01–0.02 mg. of lactic acid. The colors may be compared in small flat-bottomed Nessler tubes, or the concentrated acid solutions may be compared in the Duboscq colorimeter without injury to the cups. On prolonged standing a turbidity develops in the blood filtrates which renders it impossible to read them accurately.

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**Effect of opiates on memory and behavior of albino rats.**

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Studies were made by the authors on the behavior of white rats in Watson's circular maze. A total number of eighteen rats was used. The animals were trained to find their way through the intricate labyrinth of the maze in the shortest period of time without making any error. They were then injected with the various drugs studied, and their behavior, both immediately after injection and for some time afterwards, was observed. The experiments on the rats in the maze gave data concerning the memory habit of the animals, their activity, and the coördination of their movements after the administration of the narcotics. A large number of experiments was performed on different rats, and the effects of the following opiates were studied: Morphin, codein, thebain, narcotin, narcein and papaverin. In addition to the individual alkaloids, the following combinations were also administered: pantopon (total opium alkaloids) and narcophin (morphin plus narcotin).

It was found that morphin, in both large and small doses, impaired the memory and the behavior of the rats. In the case of only one of the animals was there an excitation or stimulation noted after small doses of the drug. After large doses of morphin, the impairment was long-lasting, continuing for several days. In most cases, however, the animals eventually completely recovered from the effects of the narcotic.

In regard to the comparative effects of morphin alone and morphin given in combination in the form of pantopon or narcophin, the following interesting observations were made: Out of 26 experiments with pantopon and morphin, in 22 the effects of morphin were found to be more depressant than those of pantopon.

Out of 9 experiments with morphin and narcophin on the same animals, 7 experiments showed that morphin was more depressant than narcophin. In all the experiments with the opium alkaloids, the effects were noted on both the time in which the rats went through the maze and the total distance traversed or the number of errors made.

Codein, in 9 experiments out of 11, produced impairment, as indicated by both the time and the distance. Narcotin, in 5 experiments out of 7, produced also a depression. Narcein, out of a total number of 10 experiments, produced a slight depression in 4, and no effect in 6. Thebain indicated a slight retardation in 10 experiments out of 11. In the case of papaverin, it was found that very little effect was produced by small doses of the drug, but that after large doses (10 or 15 mgs.), a depression was noted. The complete data of this research will appear in due time in the *Journal of Pharmacology and Experimental Therapeutics*.

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**On the generalization of *Treponema pallidum* in the rabbit following local inoculation.**

By **LOUISE PEARCE** and **WADE H. BROWN**.

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That a widespread dissemination of *Treponema pallidum* may be produced in the rabbit by local inoculation has been shown