such that they might well be concerned with light reception, but carefully executed experiments will be necessary in order to make this matter certain.

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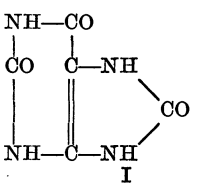
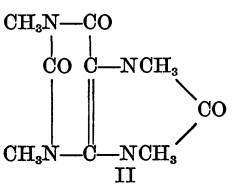
THE DISCOVERY AND IDENTIFICATION OF A NEW PURINE ALKALOID IN TEA

ALL the N-methyl derivatives of 2,6,8-trioxypurine I theoretically possible have been prepared synthetically, and we have to-day a very complete knowledge of their chemistry. Emil Fischer and Heinrich Biltz, with the collaboration of many coworkers, are the two investigators who have contributed the most to our present knowledge of the chemistry of these purines and their derivatives.



I



II

The occurrence of 2,6,8-trioxypurine as a product of purine catabolism in both the animal and plant kingdoms has been demonstrated conclusively, but, so far as the writer is aware, no N-methyl derivative of the purine I has, thus far, been shown to occur in nature. The author now presents this short note to report that the *tetramethyl-2,6,8-trioxypurine* represented by Formula II occurs in the mixture of purine alkaloids extracted from tea. It has been separated in a pure condition from such extracts, and has been shown to be identical with *1,3,7,9-tetramethyl-2,6,8-trioxypurine II* (tetramethyluric acid), which was first described by Emil Fischer[1] in 1884. Just as soon as proper and sufficient experimental material becomes available for the continuation of our plant extract researches, it is the intention of the author to search for this alkaloid and other N-methylated purines in the purine extracts of coffee and other plants. The results of this research program will be discussed in future papers to be presented for publication in the *Journal* of the American Chemical Society.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A CONDENSER DISCHARGE STIMULATOR FOR PHYSIOLOGICAL PURPOSES

THE stimulator described in this report has been designed for the determination of the adequate shape and duration of current pulses used as stimuli on the cerebral motor cortex.[1] It has been found a useful device for general stimulation experiments wherever an attempt is made to gain more information about the excitable structures responsible for a certain effect. It also provides for a selective stimulation[2] in mixed peripheral nerves or in mixed tracts or centers within the central nervous system.

The set-up is based on the principle of condenser discharges adapted to the relatively low resistance of the tissue to be stimulated through a single-stage power amplifier.[3] It allows stimulation with alternating single or double condenser discharges whose duration, *i.e.*, time constant, can be changed over a wide time range (from .01 to 100 or 1000 milliseconds) without any change at all in the amplitude (peak intensity) of the discharges. The stimulating voltage, up to 10 or 20 volts, is led off from a potentiometer of 2,000 ohms maximum resistance. Any influence of the stimulating circuit upon the time constant of the condenser system is excluded.

From a source of potential A two condensers C and C^1 of different capacities are charged by make of K over two identical resistances R and R^1 to the same voltage, and they discharge over the same two resistances and a common resistance S, low in comparison with R and R^1, when K is opened. The resulting potential wave between x and y has its shape and direction determined by the ratio of one capacity to the other. It represents an ordinary condenser discharge if one condenser is disconnected, and a double condenser discharge (see[3]) if both condensers are placed in the circuit. Any such potential wave between x and y causes in the plate circuit of the amplifier tube AT (Cunningham 2A3) a current wave of identical shape. The resting plate current of AT is compensated by another similar tube CT with adjustable heater resistance. Equilibrium between the two tubes, *i.e.*, absence of potential between the ends of the potentiometer p, is controlled by a high resistance galvanometer v. Both halves of the potentiometer are divided into twenty intervals of 50 ohms each. Provided that the stimulating current is always led off from two symmetrical steps on the corresponding halves of the potentiometer, the current in the stimulating circuit is only due to, and directly pro-

[1] O. A. M. Wyss and S. Obrador, *Am. Jour. Physiol.*, in press (1937).

[2] O. A. M. Wyss, *Schweiz. Arch. f. Neur. u. Psych.*, 28: 210, 1932.

[1] Emil Fischer, *Ber.* 17: 1784 (1884); also *Ber.* 30: 3009 (1897).

[3] *Idem.*, *Pflüger's Arch.*, 233: 754, 1934.