fonamido)-pyridine is sulfapyridine. Undoubtedly the greater part of the reduction takes place in the intestinal tract. However, macerated liver or kidney incubated at 37.5°C in a phosphate buffered solution (pH 7.4) also caused a reduction of 2-(p-nitrobenzenesulfonamido)-pyridine.

2-(p-nitrobenzenesulfonamido)-pyridine fed to rabbits was isolated from urine in the form of acetylsulfapyridine. Following oral administration of 7-8 g of 2-(p-nitrobenzenesulfonamido)-pyridine daily to man, free sulfapyridine was isolated from the urine.

We wish to point out that 2-(p-nitrobenzenesulfonamido)-pyridine may have a therapeutic application in the treatment of lower intestinal infection, since the reduction of 2-(p-nitrobenzenesulfonamido)-pyridine in the intestinal tract by *B. coli* would undoubtedly give rise to significant concentrations of sulfapyridine and probably to other reduction compounds which might be therapeutically effective.

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Injection of Heavy Water into the Cerebro-Spinal Fluid Space.*

KARL STERN AND T. E. DANCEY. (Introduced by D. McEachern.)

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After Barbour[1] and his associates had demonstrated the sympathicomimetic action of heavy water in mice when 1/5 of the body water was replaced by heavy water it seemed interesting to study the effect of partial replacement of cerebrospinal fluid by normal saline made up of heavy water. The experiments were carried out in 2 akinetic catatonic patients (male, age 35, female, age 30). A certain amount (see below) of cerebrospinal fluid was withdrawn and replaced by a physiological saline solution made up in 99.5% deuterium oxide instead of water. This was done by lumbar puncture in the recumbent position and the head lowered during the injection. In the first case 2 cc and 3.8 cc of heavy water saline were thus injected at an interval of 6 days. In the second case 10 cc were injected first, 22 cc and 14.2 cc later with an interval of 14 days between each injection. The cerebrospinal fluid was examined 8 hours after

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[1] Barbour, H. G., and Herrmann, J. B., *J. Pharm. and Exp. Ther.*, 1938, **62**, 158.

the first injection and thereafter at increasing intervals of 2 days to 3 weeks until 2 months after the last injection.

The results can be briefly summarized as follows: There was no appreciable change in the psychiatric or neurological picture, nor in the pulse rate, temperature, respiration, blood pressure, basal metabolic rate, blood cholesterol, sugar tolerance curve and kidney function. There was a marked cellular reaction in the cerebrospinal fluid. This was highest 8 hours after the injection (380 cells after 2 cc in case 1; 470 cells after 10 cc in case 2). This reaction changed within 2 days from a polynuclear one to a lymphocytic one. The cellular reaction was much stronger than could be expected from repeated lumbar puncture and it could be observed as long as 2 months after the last injection (7 cells per cmm). It was also more marked and prolonged than might be expected from equal amounts of normal saline. There was also, during the first 2 days, an increase in total protein (from 0.015 to 0.040 g %).

The long-standing cellular reaction is noteworthy because Herrmann[2] has shown that heavy water disappears from the cerebrospinal fluid spaces within 30 minutes, whereas meningeal reactions of this duration are commonly associated with the presence of slowly reabsorbed material in the cerebrospinal fluid spaces (Finlayson and Penfield[3]).

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Precipitative Tests in Malaria.*

ANNA DEAN DULANEY AND VIRGINIA HOUSE. (Introduced by L. A. Crandall.)

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We have obtained precipitative reactions in human malaria with *P. knowlesi* antigens through use of the collodion-agglutination method of Cannon and Marshall,[1, 2] and the collodion fixation procedure of Goodner.[3]

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2 Herrmann, J B., *J. Pharm. and Exp. Ther.*, 1939, **67**, 265.

3 Finlayson, A. I., and Penfield, W., *Arch. Neur. Psych.*, 1941, **46**, 250.

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1 Cannon, P. R., and Marshall, C. E., *J. Immunol.*, 1940, **38**, 365.

2 *Ibid.*, 1941, **40**, 127.

3 Goodner, Kenneth, *Science*, 1941, **94**, 241.