

definitely superior to sulfanilamide in that it is less toxic. A very large dose of sulfapyridine can be given at one time to sterilize the infection without producing any toxic symptoms. These experiments also indicated the prompt penetration of the drug into the brain tissue.

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Relation of Water Metabolism to Porphyrin Incrustations in Pantothenic Acid-Deficient Rats.

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It had previously been observed that the material which accumulated on the fur and noses of pantothenic acid-deficient rats exhibited a red fluorescence. This symptom had been erroneously described as "nose bleed"¹ and "blood-caked whiskers".² This fluorescent material contained large amounts of porphyrin, and the chemical tests for blood were negative.^{3, 4} It was clearly demonstrated by an ablation experiment that the Harderian (lacrimal) gland is the source of this porphyrin secretion.⁵

During the preliminary preparation for the above experiment, it was observed that the water bottles in 2 of the cages had failed to deliver water. There were six 21-day-old albino rats in the 2 glass cages. Thick incrustations of fluorescent material were observed on the noses and near the medial angles of the eyes and smeared on the fur of all 6 rats. The other 18 rats with abundant water did not show this. Thus within a period of 3 days normal rats deprived of water developed what appeared to be one of the symptoms of pantothenic acid deficiency. When the rats were given water, they

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¹ Daft, F. S., Sebrell, W. H., Babcock, S. H., Jr., and Jukes, T. H., *Pub. Health Rep.*, 1940, **55**, 1333.

² Unna, K., *J. Nutrition*, 1940, **20**, 565.

³ Chick, H., Macrae, T. F., and Worden, A. H., *Biochem. J.*, 1940, **34**, 580.

⁴ McElroy, L. W., Salomon, K., Figge, F. H. J., and Cowgill, G. R., *Science*, in press.

⁵ Figge, F. H. J., and Salomon, K., submitted for publication.

drank and then began to wash the incrustated material off. In less than one hour, they appeared to be as clean as the other 18 rats.

A relationship between water deprivation and pantothenic acid deficiency was suggested by the fact that both conditions had resulted in identical accumulations of red fluorescent material. Observations in other experiments supported this possibility.⁸ Accordingly, the present experiment was conducted to study more carefully the relationship between various degrees of partial dehydration and the accumulation of the fluorescent incrustations on the fur and noses of rats.

Fourteen young albino rats (7 male, 7 female) were kept in individual cages and were given unlimited food (Tioga Dog Pellets) throughout the experimental period. Four of the animals were used as controls. During a 4-day preexperimental period and during the experiment, the controls were allowed all the water they would drink, the quantity being measured daily. These values and the data of Richter⁶ were used to calculate the normal daily water intake of rats. Of the remaining 10 animals, 4 were given 50%, four 37.5%, and two 25% of the normal water intake as calculated for rats of their age and size (12 cc/100 g body weight). The porphyrin accumulation, weight, and water ration or intake were recorded daily for all the animals.

By the end of the first week, 8 of the 10 water-limited animals had developed fluorescent porphyrin-containing incrustations around their noses. Less frequently, similar incrustations were observed on the eyelids and forepaws. There was little correlation between the amount of water given the animals and the degree of response except that there was a tendency for the animals with less water to develop the condition more rapidly than those with higher water intake. The incrustations were not present at all times, because the animals would either wash or rub them off during periods of increased activity.

During the second and third weeks, the water rations were variously manipulated (either increased or decreased). When the animals were maintained on less than 25% of normal intake or when completely deprived of water, the accumulation of porphyrin ceased, presumably because its secretion stopped. Porphyrin secretion and its consequent accumulation reappeared when the water ration was subsequently increased and disappeared as the normal body weight was approached. The increase in body weight was interpreted as indicating a return to the normal degree of hydration.

⁶ Richter, C. P., and Brailey, M. E., *Proc. Nat. Acad. Sciences*, 1929, **15**, 570.

At the end of the third week of the experiment, all the animals were sacrificed and the Harderian glands were examined under ultra-violet light. The glands were normal in all but 3 of the experimental animals. In the 2 rats in which porphyrin accumulation had been very slight or absent, the Harderian glands were found to be abnormal. In one of these rats, both glands were abnormally small; and in the other, one gland was small and almost non-fluorescent. However, in the third rat in which one gland was likewise small and non-fluorescent, porphyrin incrustation was similar to that observed in water-limited rats with normal glands.

Summary. Porphyrin incrustations on nose and fur, the most conspicuous symptom of pantothenic acid deficiency in albino rats, has been induced by partial dehydration of normal rats. This indicates that pantothenic acid may be involved in the regulation of water metabolism.

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Effect of Antigenic Material from *Eberthella typhosa* upon Migration of Guinea Pig Leucocytes.

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Recent work by one of the authors (Morgan)^{1, 2} demonstrated that an experimental leucopenia could be produced in rabbits by the intravenous injection of a protein-free antigen derived from *Eberthella typhosa*. Because of this property of the antigen it was desired to determine whether the material would exert a positive or negative chemotaxis towards polymorphonuclear leucocytes.

The technic employed in these experiments was that of Chambers and Grand.³ It utilizes a small capillary tube filled with the material to be tested and one end of this tube is sealed with beeswax. This capillary is embedded in a drop of normal guinea pig plasma with its open end near a small fragment of normal adult guinea pig spleen. (The plasma was prepared with 1:1000 solution of heparin.)

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¹ Morgan, H. R., *PROC. SOC. EXP. BIOL. AND MED.*, 1940, **43**, 529.

² Morgan, H. R., *J. Immunol.*, in press.

³ Chambers, R., and Grand, C. G., *J. Cell. and Comp. Phys.*, 1936, **8**, 1.