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EXPERIMENTAL VITAMIN P DEFICIENCY

RUSZNYÁK and Szent-Györgyi[1] were the first to find that flavones (citrine) behave like vitamins in man. The new vitamin was named P vitamin, because of its effect on the permeability of capillaries. Later Bentsáth, Rusznyák and Szent-Györgyi[2] found that scurvy in guinea-pigs is not only due to vitamin C deficiency, but is a mixture of deficiency in C and P vitamins. Zilva[3] could not confirm these later experiments, and Szent-Györgyi[4] did not succeed in reproducing them. Two years ago Zacho[5] showed that the diminution of capillary resistance in guinea-pig scurvy has no connection with a lack of ascorbic acid, and can only be made to cease with citrine. It seemed that with the help of a method based on this result vitamin P deficiency could be studied and the efficiency of various citrine preparations controlled. Our own experiments are in agreement with those of Zacho, and we succeeded in showing that those citrine preparations which have a therapeutic action in man, cause the diminished capillary resistance to disappear in the guinea-pig. As it appeared that the scurvy diet is not only deficient in ascorbic acid, but in flavones also, we have studied the effect of a scorbutogenic diet on rats. It is well known that the rat does not develop scurvy even on a diet lacking ascorbic acid. It appeared that under the influence of a scorbutogenic diet the rats did not, in fact, develop scurvy even after a long period of time, but their capillary resistance, measured with the Borbély method, di-

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[1] *Nature*, 138: 27, 1936.

[2] *Ibid.*, 138 : 798, 1936 ; 139 : 326, 1937.

[3] *Biochem. Jour.*, 31 : 915, 1488, 1937.

[4] *Hoppe-Seylers Zeits.*, 255 : 126, 1938.

[5] *Acta path. scand.*, 16 : 1411, 1939.

minished considerably in 5 to 6 weeks. When we gave such rats with diminished capillary resistance 3 to 4 mgm. of. citrine per day subcutaneously, their capillary resistance became normal in 10 to 14 days. It became clear, therefore, that one can study vitamin P avitaminosis and control the efficiency of citrine preparations on guinea-pigs with scurvy and rats kept on a scorbutogenic diet. These animal experiments are in entire agreement with the results of Scarborough,[6] who has recently published observations which prove the occurrence of isolated P avitaminosis in man.

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[6] *Lancet*, 2 : 644, 1940.