

VITAMINS.

BY MISS ISABEL MACDONALD, S.R.N.

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VITAMIN B.

Vitamin B, or rather perhaps one should say the category of Vitamin B, is concerned to some extent with growth. Vitamins of this class are usually considered under two heads, Vitamin B1 and Vitamin B2, and there are other classes known as B3 and B4, but the knowledge which has been collected regarding these last is not sufficiently important as yet to call for reference.

A deficiency of B1 gives rise to polyneuritis and such deficiency has a very direct relationship to the disease known as beri beri; a symptom of this is inflammation of the nerves and so B1 is termed an "anti-neuritic" vitamin. Besides severe nervous conditions there arise, in beri beri, such symptoms as digestive and intestinal disturbances, heart weakness, cedema and paralysis, impairment in the powers of assimilation, weakened functioning of the endocrine glands, great waste of muscle and curious "prickly" sensations in the skin. Beri beri was prevalent in the Japanese navy some fifty years ago and its cause was traced to the use of *polished* rice; it is in the husk of cereals that the vitamin B1 is to be found chiefly. Many neurasthenics and people suffering from intestinal disorders may owe such conditions to a deficiency of B1 in their diet. Marasmus (*i.e.*, wasting) in children often responds very quickly to a diet of food rich in B1.

As already indicated, it was the study of the disease beri beri which led to the discovery of B1 and it is most common among the rice-eating people of the east. Three forms of experiment have been used in connection with the supply of a sufficient amount of B1 to the body. The first is a protective test and demands an estimate of the daily ration of a particular food necessary for the prevention of beri beri when added to a vitamin free diet, *e.g.*, polished rice is given to pigeons to produce beri beri symptoms. The second experiment involves a maintenance test; the criterion adopted is the maintenance of body weight in an animal on a diet of polished rice, but this is not a very satisfactory experiment. The third test is a curative one, for a diet free from B1 is given until symptoms of beri beri appear and then Vitamin B1 is supplied in daily increasing amounts to different birds and the results are observed. The following foods are rich in B1—unpolished rice, bran, whole barley, green and dried beans, lentils, peas, rye flour, yeast, whole meal, egg yolk, liver, heart muscle. Potatoes, milk and meat are poor in this vitamin and it is absent in polished rice, tapioca, sago, pearl barley, white flour and sterilised foods.

Vitamin B2 is sometimes called G or, it may be, the "anti-pellagra" vitamin. It usually accompanies vitamin B1; as a general rule, but not always, it exists in proteins of high biological value and it is not surprising therefore that the disease which arises from a deficiency of B2 has been found largely in countries where first-class proteins have not habitually entered very largely into the dietary. This disease, termed pellagra, is characterised by peculiar skin eruptions and mental symptoms that usually culminate in in-

sanity. The following foods have in their composition the anti-pellagra vitamin—dried yeast, lean beef, pork, liver, and tinned salmon. Wheat germ has also a fair amount and also milk, tomatoes and yolk of egg. Maize casein, butter, soya bean and carrots have very little.

VITAMIN C.

Vitamin C is best known as the factor in our food upon which we rely to prevent scurvy in circumstances where people are compelled to live largely upon preserved or dried foods. The function of this vitamin was known long before the vitamin itself was isolated or even so much as thought of. The discovery of some property in certain foods which had the power to prevent scurvy is told in Lind's treatise of 1757 on scurvy:—

"A sailor in the Greenland ships was so over-run with scurvy that his companions put him on a boat and sent him on shore, leaving him to perish there with no expectation of recovery. The poor wretch had quite lost the use of his limbs; he could only crawl about the ground. This he found covered with a plant which he, continually grazing like a beast of the field, plucked up with his teeth. In a short time he was by this means perfectly recovered and upon his returning home it was found to be the herb 'scurvy grass.'" Medical science owes much to the work done by Lind but like many another he was ahead of his time and found it almost impossible to persuade his colleagues that so terrible a disease could be cured by methods so simple as those he advocated; like the people of to-day, some harmless and useless coloured fluid in a bottle would have been much more convincing than vegetables or the juice of a lemon. However the renowned Captain Cook made good use of the teaching of Lind and thereby maintained the health of the sailors on the long voyages he made. Another historical fact of great importance lies in the entire elimination of scurvy from the navy in 1795 by the issue of an ounce of lemon juice to each man daily. It was called lime juice but it was actually lemons which were used; lime juice has never given quite the same successful results. Captain Cook found that goats, sheep and pigs contracted scurvy after they had been several months on board his ship. It is curious that cats, rats and birds do not get the disease and it is assumed that they have special powers to produce vitamin C in their own tissues, perhaps from one of the other vitamins. The guinea pig is an animal which has been especially valuable in the tests made to ascertain which foods are rich in Vitamin C, but man's requirement of this vitamin is twenty times that of the guinea pig. The amount necessary to children is relatively very large in proportion to that required by adults and an infant should have half as much as a man. The medical term used in the part to describe scurvy was scorbutus and therefore Vitamin C is spoken of as the "anti-scorbutic" vitamin. It is present in abundance both in oranges and lemons and so orange juice is very frequently given to artificially fed babies. An investigation in a large dental clinic in America in 1929 showed that a very great proportion indeed of the cases of dental caries arose in children between six and sixteen years whose diet was proved to be deficient in Vitamin C.

Scurvy is believed to be a disease of the skin, but it is

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