



## PHYSIOLOGY

# Vitamin for All Life Found And Partially Synthesized

ONE vitamin out of the whole alphabet of them is probably essential for the growth of all living things, from bacteria, fungi, seed plants and similar lowly forms to the higher animals and possibly man himself.

Two new discoveries which indicate that there probably is such a universal vitamin appear in technical reports to the *Journal of the American Chemical Society*. At the same time partial synthesis of the vitamin is reported.

The vitamin is part of the large group of B vitamins, which include the anti-beriberi vitamin, thiamin, the anti-pellagra vitamin, nicotinic acid, and riboflavin. The universal vitamin is called pantothenic acid, its Greek name indicating that it is found everywhere. This vitamin was first discovered by Prof. R. J. Williams (brother of Dr. R. R. Williams, who synthesized another vitamin, B<sub>1</sub> or thiamin) and associates at the University of Oregon, who found that it stimulates the growth of yeast.

The latest discoveries, indicating that this vitamin promotes growth of chicks, are reported by two groups of experimenters, Dr. Thomas H. Jukes of the University of California and Drs. D. W. Woolley, Harry A. Waisman and C. A. Elvehjem of the University of Wisconsin. Dr. Elvehjem is the chemist whose studies of nicotinic acid led to its becoming the cure for pellagra.

Dr. Jukes reports that a preparation of pantothenic acid (calcium pantothenate) protected chicks from a dermatitis which develops when they are on a diet lacking in part of the vitamin B group called the filtrate factor. Dr. Elvehjem and associates report partial synthesis of this filtrate factor which their chemical studies show is very similar to pantothenic acid.

"Final proof of the identity of the two," they state, "must await crystallization of the pure compound."

The discoveries are probably important in connection with man's nutrition, even though chicks are the experimental animals on whom these discoveries have been made. Prof. Williams, discoverer of the universal vitamin, pantothenic acid, points out in a statement to Science Service.

From his new post as professor of chemistry at the University of Texas he sent the following explanation of the significance of the discoveries:

"Since its discovery it (pantothenic acid) has been found to be not only present in widely different tissues and organisms but to function as a potent physiological substance stimulating the growth of yeasts, molds, lactic acid bacteria, diphtheria bacillus, protozoa, young alfalfa seedlings and liverworts, and to stimulate the respiration of various tissues.

"The present discovery of Jukes and of Woolley, Waisman and Elvehjem is the first one linking it up definitely as a 'growth promoting substance' for higher animals, though it has been recognized as a constituent of all types of animal tissue and to be stored in the livers of all animals.

"Too great significance should not be placed upon the fact that chicks are the experimental animals used in these first experiments. There is evidence that the same substance is required by pigs and dogs and the inference is not a wild one that it is necessary for the nutrition of all of the higher forms of animal life and that it makes up an essential part of every living cell.

"One of the interesting features regarding this discovery is that it demonstrates anew the kinship of the whole organic world, since the lowly microscopic yeast cell requires for its nutrition the same substance as is required by higher animals. Pantothenic acid is produced by various molds and microorganisms in the soil and elsewhere and by green plants after they develop their photosynthetic apparatus.

"Not all of the vitamins seem to be as universal in their function as pantothenic acid. Yeast which is typical of the lower plant life apparently does not contain vitamin A, vitamin D, vitamin E or vitamin C, unless especial means are taken (such as irradiation with ultraviolet light) to place them there. It seems probable that these vitamins may not be essential to all forms of life. Vitamin B<sub>1</sub> and nicotinamide, on the other hand, like pantothenic acid, are probably universally present in living matter."

*Science News Letter, May 13, 1939*



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