

# SCIENCE

VOL. LX

NOVEMBER 14, 1924

No. 1559

## THE CHEMISTRY OF VITAMINS<sup>1</sup>

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SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

### THE SCIENCE PRESS

Lancaster, Pa.

Garrison, N. Y.

New York City: Grand Central Terminal.

Annual Subscription, \$6.00. Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 3, 1879.

THE existence of substances to which the name vitamin has been given was first recognized some fourteen years ago, and since that time much information has been obtained concerning their source, distribution, physiological and other properties, but comparatively little in regard to their chemical structure. This has been due to the fact that until recently it has not been possible to isolate any one of them in a relatively pure condition.

The difficulties in connection with the purification of vitamins have been due, among other things, to the complex character of the raw materials in which they occur, the small percentage present, the destructive effect of many of the reagents and laboratory manipulations used for their fractionation and finally, the want of a reliable chemical test by which the success of the purification steps could be controlled. In the absence of a chemical test it has been necessary to rely upon feeding experiments, which require much time and do not give uniformly dependable results.

In spite of the difficulties which have and will be encountered in the chemical study of vitamins, it is one of the most attractive problems which can occupy the attention of an investigator. The several vitamins perform essential functions in the nutrition of animals and on them depend growth, health, reproduction and completion of the life cycle. There is evidence that they are not of excessively complex or fugitive character, and the prospects of success in determining their chemical constitution is encouraging. Such information when obtained will undoubtedly contribute more to human welfare than can now be appreciated.

The proper selection, preparation and conservation of the food supplies of man and of domestic animals is intimately connected with a knowledge of the chemical properties of vitamins. Future modifications of food products will undoubtedly exceed those of the past. A comparison of the foodstuffs of primitive populations with the package products of to-day will give a faint hint of the extent of the improvements which may be expected in the future.

The modification of natural food products for the purpose of conservation and economical preparation for consumption is a field of endeavor which is deserving of unlimited effort. When there is also con-

<sup>1</sup> Presented before the Division of Medicinal Products at the 67th meeting of the American Chemical Society, April 22, 1924.

# Science

**60 (1559)**

*Science* **60** (1559), x-460.

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