

share to the scientific work of the world during the next generation. It means that medicine will not develop in this country as it will elsewhere in the world, where chemical sciences are recognized as being fundamental to a knowledge of the human body in health and disease and to the maintenance of the public welfare.

I appeal to you gentlemen, whose interests are closely allied with those of the chemical manufacturer, for support at this critical time which means so much to the future of this, our common country.

VITAMINES, AN INDISPENSABLE NUTRITIVE GROUP.*

BY M. F. WILSON, M.D.

The subject of the vitamins is of particular interest to the pharmaceutical profession, due to the fact that it presents not only the most recent advance along pharmaceutical lines of the last few years, but also due to the fact that the vitamins are the most frequently discussed subject in medical literature, as well as among the lay magazines and the daily press. Over 110 papers have appeared in the last three years in medical literature upon this subject, and in our newspapers, under public health columns, the subject is mentioned almost daily. Only a short time ago, a celebrated writer suggested the possibility that in the near future we would have a shaker containing extract of the vitamins alongside of our salt and pepper cellars, in order that we might apply the extract to our food rations to make up for the deficiency.

It is only in later years that this substance has been studied with any degree of accuracy, but clinicians and pathologists have long known that there were certain diseased conditions arising in the course of their studies which could not be traced to any then known etiology. Most of these conditions can now be classed under the heading of "Vitamin Deficiency" diseases. Jack London, in his story of "The Tale of the North," recites an incident where the early pioneers in the Alaskan region were affected during the winter months with scurvy in which they found that the eating of raw potatoes was curative. He states that when this fact became generally known this article of diet increased in price to such an extent that it became a bankable commodity. In the light of the present knowledge we know that potatoes simply supplied the lack of vitamins and brought about a cure in this way.

During the last war in certain regions of the old world, particularly in Denmark, children who were fed upon the so-called centrifugalized milk and "export" cream developed a variety of peculiar but characteristic symptoms, but upon the feeding of these infants with whole milk and cod-liver oil containing vitamins, they rapidly improved and soon became normal.

The beginning of the scientific study which ultimately resulted in the isolation of the extract of the vitamins dated from the Japanese-Russian war. Sailors of the Japanese navy were attacked with a malady called beri-beri or polyneuritis. Hundreds of these men were affected, suffered agonies and resulted in the death of many. The disease was characterized by soreness in certain sets of the muscles, gastric disturbances, loss of power in the muscles of the legs, heart ir-

* A brief extract from an illustrated lecture delivered before Section on Practical Pharmacy and Dispensing, A. Ph. A., New Orleans meeting, 1921.

regularities, "dropsy" which was frequently followed by paralysis and death. The medical officers of the Japanese Navy investigated the cause of the malady and decided that it was the same disease described by a Russian physician previous to the war, in which a diet of unpolished rice had proved curative. The Japanese physicians adopted this diet and, much to their gratification, found that those who were suffering from the disease, and had not advanced too far, soon became normal and the disease did not again make its appearance as long as an unpolished rice diet was adopted.

From this medical episode a number of investigators began the study of this subject, among the most prominent being Funk, McCarrison, Emmett, Allen Cooper, Drummond and others. These investigators soon learned that in order for food to be effective, it must contain the vitamins in proper proportions, in order that a life process may go on normally.

To date, three classes of vitamins have been discovered, namely: fat soluble A, water-soluble B, and water-soluble C. The fact is well established that each of these three types bears a specific rôle in nutrition, and that all three must be present in the body to produce the optimum results. A recent editorial in *The Nation's Health* states that "It is more than probable that many of the more obscure disorders and all sorts of common languors, inefficiencies, and susceptibilities, and many miscellaneous infections are classed with a shortage of vitamins." It has been proved beyond doubt that the vitamins are essential to growth, development, reproduction, and maintenance of the normal physiological state in practically all forms of animal life, from the highest to the lowest.

Experiments on rats and other animals show that an absence of the fat-soluble A vitamin will produce in a short time a marked loss of weight, disordered nutrition of the skin, and a peculiar condition of the eye, called xerophthalmia. This condition of the eye is peculiarly interesting and experiments have been conducted to prove that it can only be caused by a diet in which the fat-soluble A vitamin is lacking. The disease is characterized by a conjunctivitis with atrophy of the cornea without liquid secretion. If allowed to continue, the disease will result in total blindness.

Clinical experiments have also proved that conditions similar in type may also be brought about in children who are fed upon overheated and centrifugalized food. The effect of the absence of water-soluble B vitamin in animals seems to be directed towards the nervous system, with the maximum effect upon the spinal cord. In pigeons and rats this is shown by a peculiar paralysis of the limbs. The animal loses the use of the limbs altogether. If this condition is allowed to continue the result will be convulsions, and ultimately death.

Water-soluble C vitamin deficiency diet will bring about in animals scurvy characterized by soreness of the gums, bleeding which will go on to ulceration, pus will exude, and the teeth will become loose in their pockets, absorption of the alveoli may take place in some instances, suggesting in every respect symptoms ordinarily observed in pyorrhea alveolaris, in human beings.

The absence of the vitamins has a peculiar effect upon the gastrointestinal tract, and, according to McCarrison, dilatation of the stomach, indigestion, deficient action of the liver and pancreas, air-locks in the small intestines, and even colitis may be produced by a low vitamin deficiency diet.

Now as to the practical application of the study that has thus far been done on the vitamins, the following facts are important: We know that foods are affected as to the vitamin contents by the modern process of canning, by boiling or heating to the boiling point, for a certain length of time, absolutely destroying the water-soluble B if the heat is maintained for two or more hours. Fat-soluble A is injured at least in part, and water-soluble C is destroyed in a very short time.

Vegetables placed in cold storage for a great length of time injure the vitamins and dried vegetables for preservation are often injured by the process. Moreover, we know that some persons live on a one-sided diet, and that oftentimes it is difficult, in children especially, to have them eat the proper assortment of food. Eddy and others have found that even though the diet of a child contain an appreciable amount of vitamin B, there was a marked stimulation of growth when three percent of the extract of vitamins was added to the food. He explained this on a basis that an extracted vitamin is more readily available than that contained in the food.

It is thought by some authorities that the vitamins act as catalyzers, and that their mere presence enables the system to absorb and assimilate the food products. Therapeutically the vitamins are indicated in the treatment of malnutrition, and disordered metabolism in such vitamin deficiency diseases as rickets, beri-beri, pellagra and scurvy, in the convalescence from acute infectious diseases, in certain intestinal disorders and as an adjunct treatment in ill-defined disorders of nutrition, anemia and other dyscrasias.

ABSTRACT OF DISCUSSION.

Chairman H. M. Faser thanked Dr. Wilson for his address and asked him whether he would answer questions proposed by members. Replying that he would—

F. W. Nitardy inquired whether a well-balanced diet would not supply the vitamins. Dr. Wilson replied that it would, but children at the same table would differ in their preferences for food; certain individuals cannot assimilate foods containing the necessary vitamins. Experiments bearing on the question were shown.

REVISING THE NATIONAL FORMULARY.*

BY P. HENRY UTECH.

Much of that which transpired and was transacted at the City of Pittsburgh meeting of the American Pharmaceutical Association thirty-five years ago has been forgotten, or is part of the records of the Association. The outstanding feature of that Convention, which has proven to be epoch-making in character, was the appointment of the committee which later, in 1888, brought about the publication of the first edition of the National Formulary. It is, therefore, particularly fitting that you, as representative pharmacists, encourage the fine spirit of these pioneer pharmacists, and do your part in carrying on this good work, the publication of which stands out as a waymark in the onward march of pharmacy.

The revisions of the National Formulary reflect the progressive spirit of our calling. The statement is frequently heard, that pharmacy as a profession is retrograding, is fast losing its prestige; that the inroads of commercialism are demoralizing all that is fine, honorable and ethical in our calling. Statements of this character, with only slight modifications, would, perhaps, apply with equal

* Parts of an address before Pittsburgh Branch, A. Ph. A., November meeting, 1921.