# SCIENCE NEWS

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## THE NOBEL PRIZES

THE two winners of the 1943 Nobel prize in medicine tell in their own words what their researches on the anti-bleeding vitamin K mean to the world and what new developments may be expected. Modern physics aided the two 1944 Nobelists, one of them states, describing their joint work:

Gladly surprised at being recipient of a Nobel prize in medicine, my thoughts turn to work still to be done on vitamin K as well as to the days of its discovery.

Future research must clear up the manner in which vitamin K acts to promote the formation of prothrombin, one of the blood chemicals essential for normal clotting of blood when shed. It is only known that the process takes place in the liver.

It also remains to be found out what role vitamin K plays in the green plants and in bacteria.

Vitamin K, first found in Copenhagen in experiments with chicks, is necessary for blood clotting. Without vitamin K fatal bleeding occurs even from minor wounds.

Vitamin K is fat-soluble and occurs in various foods, especially in green vegetables. It also occurs in putrefaction bacteria.

Vitamin K prevents bleeding diseases which are due to lack of prothrombin, a protein-like substance occurring in the blood of normal persons. Vitamin K is not related to the hereditary bleeder's disease, hemophilia. Vitamin K deficiency occurs in cases of so-called obstructive jaundice caused by gall stones or tumors which obstruct the flow of bile into the intestine, bile being necessary for the absorption of vitamin K from foodstuffs through the intestinal wall into the blood stream.

Death from continuous bleeding was formerly a very serious problem in surgical operations on such patients, but this risk is now avoided by suitable administration of vitamin K.

Newborn babies are usually more or less vitamin K deficient because the vitamin does not readily pass over from mother to fetus. Danger of bleeding exists in many newborn in the first few days after birth. This danger is prevented and the death rate among the newborn reduced by administration of vitamin K to the baby immediately after birth. Certain forms of sulfa drug treatment will kill the bacteria in the patient's intestine, thereby excluding an important source of vitamin K. Vitamin K therapy is advisable in such cases.

Uncontrolled excessive use of mineral oil may interfere with the proper absorption of vitamin K as well as of other vitamins.—HENRIK DAM.

During the decade following Dr. Dam's discovery of vitamin K, the combined efforts of several groups of investigators have solved many of the important problems connected with vitamin K. Sources of the vitamin were discovered and in my laboratory methods of extraction and purification were devised. A satisfactory bioassay method was developed, and the isolation of vitamin K1 (from alfalfa) and K2 (from putrefied fish meal) was effected. The structures of K1 and K2 were elucidated and the structure of K1 verified by synthesis and of K2 by degradation studies. In addition, simple water-soluble compounds with antihemorrhagic properties were prepared for clinical use.

Many investigators had previously attempted to ascertain the cause of the impaired coagulation of blood in obstructive jaundice but it was not until 1935 that Dr. A. J. Quick and his associates devised a satisfactory method for the determination of prothrombin and showed that in obstructive jaundice the prothrombin concentration may be markedly reduced. The delayed coagulation in obstructive jaundice as well as in vitamin K deficient chicks can be corrected by the administration of vitamin K and bile or of the simple-water-soluble compounds with antihemorrhagic properties. In certain diarrheal diseases, such as ulcerative colitis, sprue and celiac disease which may cause hypoprothrombinemia, the intravenous therapy of vitamin K is effective. Another important therapeutic use of vitamin K is to correct the hemorrhagic disease of the newborn. The treatment is extensively and effectively used in the mother prenatally or in the infant after birth.—EDWARD DOISY.

The work for which the 1944 Nobel prize in medicine was awarded to Dr. Joseph Erlanger, of Washington University, St. Louis, and myself, is the direct outgrowth of the advancements of modern physics.

One of the signs of activity in the nervous system is a change in the electrical potential accompanying the events and this sign is the only one that tells when the events take place. These changes are so small that formerly they were difficult to detect and at the same time the inertia of the recording instruments distorted their time course. After the advent of the vacuum tube amplifier and the cathode ray oscillograph it was possible to develop a technique that surmounted both difficulties and then many older observations could be clarified and new ones brought to light.

The first developments were in relation to the peripheral nerve. It was possible to reveal differences in the individual fibers that make up a nerve, differences in the velocity with which impulses are carried related to the size of the axons and differences related to the kind of fiber, for it has turned out that fibers can be divided on criteria other than velocity into three classes.

To a limited extent the several groups of fibers could be related to the physiological significance of the messages they carry. The events in the course of a single impulse in the fiber were determined with accuracy as to time and correlated with states of the nerve.

Certain events correlate with the momentary excitability of the fiber and this correlation forms a useful link in the chain leading up to an analytical study of the central nervous system. Some of the simplest neuron chains in the latter have been examined. But the subject is still in its infancy.

There are alluring prospects ahead with respect to the unravelling of how the central nervous system works. Needless to say, the foregoing summary contains allusions to contributions for which neurophysiology is indebted to the work of others than ourselves.—HERBERT S. GASSER.