

tendon, bone, and brain all consist of, or at least contain, protein compounds. These are formed from the myosin of meat and fish, the casein of milk, the albumen of eggs, the gluten of wheat, and other albuminoids of the food. As the muscles and other tissues are used up in bodily activity, the same materials of the food are used for their repair. Of course, the mineral matters have a good deal to do with the building up of the tissues. Thus, phosphate of lime is an essential ingredient of the bones.

The chief fuel materials of the bodily machine are carbohydrates and fats, but the protein of the food and the tissues also serves as fuel.

The animal machine differs from others in that it can use its own substance for fuel. . . .

#### How Food is Used in the Body

Food supplies the wants of the body in several ways. It either (1) is used to form the tissues and fluids of the body; (2) is used to repair the wastes of tissues; (3) is stored in the body for future consumption; (4) is consumed as fuel, its potential energy being transformed into heat or muscular energy or other forms of energy required by the body; or, (5) in being consumed protects tissues or other food from consumption.

#### MEDICINE

## Isolated Faeroe Islands Aid Study of Whooping Cough

THE FAEROE Islands, tiny spots of land far north of Scotland, have helped to prove that vaccination against whooping cough is effective.

These islands, which are under the administrative control of Denmark, offer unique opportunities for epidemiological studies. Whooping cough spreads over the islands in great epidemic waves between each of which there is an interval of years. During an interval, all who have not had whooping cough catch it. Between epidemics there are no isolated, sporadic cases.

The action of whooping cough vaccines has been investigated during two epidemics on the islands by Prof. T. Madsen who is at the head of the State Serum Institute, Copenhagen, where whooping cough vaccines are made. Under his direction 3,926 persons on the

Protein forms tissue (muscle, tendon, etc., and fat) and serves as fuel. Fats form fatty tissue (not muscle, etc.), and serve as fuel. Carbohydrates are transformed into fat and serve as fuel. All yield energy in form of heat and muscular strength.

In being themselves burned to yield energy, the nutrients protect each other from being consumed. The protein and fats of body tissue are used like those of food. An important use of the carbohydrates and fats is to protect protein (muscle, etc.) from consumption.

In this view food may be defined as material which, when taken into the body, serves to either form tissue or yield energy, or both. This definition includes all the ordinary food materials, since they both build tissue and yield energy. It includes sugar and starch, because they yield energy and form fatty tissue. It includes alcohol, because the latter is burned to yield energy, though it does not build tissue. It excludes creatin, creatinin, and other so-called nitrogenous extractives of meat, and likewise thein or caffeine of tea and coffee, because they neither build tissue nor yield energy, although they may, at times, be useful aids to nutrition.

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islands were vaccinated, either as a preventive measure, or after the whooping cough had declared itself. There were also 1,073 persons who, though susceptible, were for various reasons not vaccinated. Among these persons there were as many as 26 deaths from whooping cough, whereas among the vaccinated persons there were only 6 deaths. In other words, the mortality from whooping cough was about 16 times higher among the controls than among the vaccinated persons.

But this was not all. For, on the whole, the whooping cough ran a much milder and shorter course among the vaccinated than it did among the controls. As the vaccinated and the controls lived under precisely similar conditions, the case for whooping cough vaccination is remarkably strong.

*Science News Letter, August 5, 1933*

## CHEMISTRY AND RECENT MEDICAL PROGRESS

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an address by

**Prof. Julius Stieglitz**

Chairman of the Department of Chemistry, University of Chicago

To be given Friday, August 11, at 1:45 p. m. Eastern Standard Time over stations of the Columbia Broadcasting system. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

#### GENERAL SCIENCE

## U. S. International Dues Paid From Private Funds

DUES OF THE United States in the International Council of Scientific Unions and six international unions upon which American science is represented are being paid from private money of the National Research Council because Congress omitted the usual appropriation of about \$5,000 when it passed the State Department appropriation bill last session.

Rather than jeopardize friendly scientific relations with the international unions and with other governments, the National Research Council decided as an emergency matter to pay the 1932 quotas of this country from its funds although the present economic situation has increased the financial demands upon this coordinating organization.

*Science News Letter, August 5, 1933*

#### ARCHAEOLOGY

## Safety Assured For Famous Indian Mounds

PERMANENT safety for the famed mysterious earthworks at Newark, Ohio, has been assured by action converting the land into a state park.

The plan of the earthworks, which in prehistoric times covered 12 miles, is an amazing design of circles, squares, octagons, and long avenues. How or why prehistoric Indians carried out so complex and extensive a project has puzzled visitors to the site from the time when the earliest white men reached the Middle West. It is now be-