

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.

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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-

lieved that elaborate Indian ceremonies must have taken place at the carefully planned setting.

The modern town of Newark has obscured part of the pattern, but two large portions escaped, and these form the new state park. One portion lies in a fair ground. The other escaped being leveled when historically-minded golfers took it for a golf course, using the Indian ridges, ditches, and mounds just as they are to make a picturesque course.

Telling of long efforts to save Newark's important Indian ruins from being entirely leveled and lost, Dr. H. C. Shetrone, director of the Ohio State Museum, Columbus, said that steps are now being taken toward having the earthworks established as a national monument by the federal government.

"The Newark earthworks," said Dr. Shetrone, "are the largest and best preserved of their class in existence.

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ARCHAEOLOGY

Excavations Shed Light On Story of Jewish Exile

THE ANCIENT exile of the Jews, when King Nebuchadnezzar carried them off captive from their Promised Land in Palestine, is seen in a new light as the result of discoveries at a site thought to be the city of Lachish in southern Palestine.

It now appears that the captive Jews, whose unhappy fate in Babylonia is told in Bible narrative, were not the great mass of Jewish people. The number carried off by the conquering Babylonian king was small, if the clues found at Lachish are significant, as archaeologists believe them to be.

The new clue to Jewish history is 700 pieces of pottery, found in a number of tombs. The important discovery was made by chance, when a workman was digging up clay to use as plaster.

The hundreds of pieces of pottery form an unbroken series, showing the kind of clay wares made in Palestine from the ninth century B. C. down through the exile period three hundred years later. The Jewish history told in clay dishes proceeds in orderly fashion with no dramatic breaks in style or technique, such as would be expected if the national life was rudely disrupted by foreign conquerors and deportation of all or most of the people. Hence it is believed that comparatively few captives were taken.

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PALEONTOLOGY

Africa, Not Asia, Seen As Birthplace of Humanity

Evidence Unearthed in Tanganyika Territory Leads to Conclusion of British Authority, Geological Congress Hears

AFRICA was the original center of humanity, the scientific "Garden of Eden," Sir Arthur Smith Woodward, the British authority on ancient man, has concluded.

For some time it has seemed probable that the birthplace of true men, the kind of human beings living today, must have been south-central Asia, but Sir Arthur in a comprehensive paper delivered to the International Geological Congress meeting in Washington has summoned facts that convince him that Africa is the birthplace of humanity.

Most important is the recent skeletal evidence unearthed in Tanganyika Territory, Africa, by Dr. L. S. B. Leakey, that a kind of man lived there very early in Pleistocene or Ice Age that resembled very closely ourselves. This is taken as an indication that the modern type of man appeared much earlier in Africa than in Europe or Asia, although in tool making and presumably in general skill he has not advanced farther than cousin kinds of man, not in the direct line of descent of modern man, which existed at the same time in remote parts of Europe and Asia.

There are four types of mankind, which disappeared before the rise of true men to domination of the earth. One of these is the Piltdown dawn man, Eoanthropus, discovered in England. Another is the famous ape-man of Java, Pithecanthropus. Contemporary with these also is the Heidelberg man, known

only by one lower jaw found in Germany, who Sir Arthur doubts really deserves the name Homo. Most recently discovered but of equally great antiquity is Sinanthropus, China's fossil man. All of these are regarded as offshoots from the human stem, sort of unsuccessful experiments of nature as compared with modern man and his ancestors.

Extinct also is the Mousterian or Neanderthal man who was widespread in Europe at a time that is geologically less remote than the opening chapters of Pleistocene time during which the other extinct types lived. The Neanderthals were a second and later offshoot from the human family tree.

So a clearer picture of the human past has been drawn. A million years ago, more or less, at the beginning of the Pleistocene there were five kinds of men existing in different parts of the world. All arose from a common animal ancestor. One was destined to evolve into ourselves. Sir Arthur suggests an intensive search of the earlier layers of the earth in Africa, the Miocene and Pliocene deposits, for earlier evidence of man's rise in the evolutionary scale.

Not all anthropologists and paleontologists studying ancient man agree with Sir Arthur. Many hold fast to the idea that further research in Asia will unearth the ancestors of true man and that the true man found by Dr. Leakey migrated to Africa from Asia.

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