# SCIENCE NEWS

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## ADRENALIN DEPOTS UNDER THE SKIN

THE discovery by Dr. A. B. Luckhardt, of the University of Chicago, and Dr. Theodore Koppanyi, of Cornell University Medical College, that the powerful drug adrenalin forms depots when injected under the skin has opened the way for a new method of treatment of certain diseases.

Adrenalin has long been used to raise the blood-pressure, particularly in cases of shock following severe injuries or operations, and because of its relaxing effect on the bronchial muscles it has been used effectively in treating bronchial asthma. However, to produce the desired effect, the adrenalin had to be injected directly into a vein, and for each attack a fresh injection of adrenalin had to be made.

Drs. Luckhardt and Koppanyi have shown in dogs that adrenalin is capable of elevating the blood-pressure even if injected beneath the skin, but they have also discovered the conditions under which the blood-pressure elevating effect of the adrenalin injected beneath the skin may be elicited. They found that about fifteen minutes after the injection of adrenalin underneath the skin, when the injected area was gently massaged, there was at once a very considerable and protracted rise in blood-pressure.

Deep anesthesia militates against the effective elicitation of this response, and this is the reason why previous investigators failed to get blood-pressure rises following adrenalin injections beneath the skin. Drs. Luckhardt and Koppanyi have pointed out that adrenalin injected beneath the skin remains there for some time, and it was even possible to produce blood-pressure rises from massaging such areas which had been injected twenty-four hours before the massage.

Dr. Koppanyi has lately shown that adrenalin injected underneath the skin, with the massage of the injected areas, is just as effective in man as in dogs, and in both cases adrenalin forms a depot underneath the skin, the massage of which results in a blood-pressure rise for over twenty-four hours. It was quite obvious that this observation could be applied in the treatment of various diseases in which the administration of adrenalin is desired. There are quite a number of such conditions, the most important of them being the so-called traumatic shock, which consists of dangerously lowered blood-pressure sometimes following great injuries, operations, etc. A New York surgeon, Dr. Howard Lilienthal, has shown that by using the method of Drs. Luckhardt and Koppanyi, he could restore a patient suffering from traumatic shock.

Bronchial asthma, hives and hay fever also respond very readily to adrenalin. Before the method of Drs. Luckhardt and Koppanyi was known, it was necessary for each attack of these diseases to be checked by a new injection of adrenalin. The method of massaging the injected areas does away with that very often inconvenient procedure, and during the course of a day or two only one adrenalin injection is necessary, and the patient himself may be instructed to massage with a piece of cotton the injected area and thus get the benefit of the full therapeutic effect of adrenalin. Clinical reports have already substantiated the effect of the massage of the adrenalin-injected areas in these diseases.

## ANTI-VITAMIN IN CEREALS

OATMEAL and other cereals are suspected of harboring an "anti-vitamin" which, when too much cereal is eaten, can counteract the effects of vitamin D and cause rickets even when an otherwise adequate diet is being eaten.

Most investigators have concluded that vitamin D, which is found in fats, notably cod-liver oil, can prevent rickets, the disease that causes faulty bone formation with the familiar bowed legs and bulging foreheads in infants and children. This disease has been considered due to poor nutrition and principally to a lack of vitamin D in the diet.

However, recent experiments with cereals show that rickets is not purely a result of too little vitamin D, but is primarily due to a lowering of the amount of calcium in the blood, Dr. L. Mirvish, of the University of Cape Town Medical School, has reported to the scientific magazine *Nature*.

The presence of ricket-producing "anti-vitamins" in cereals, chiefly oatmeal and wheat, was first indicated by experiments of Professor Edward Mellanby, of Sheffield University, England, who called the substances "toxamins."

Following this lead, Dr. Mirvish extracted the "anti-vitamin" substance from oatmeal and injected it into rabbits. He found that the calcium in the blood was lowered as a result of these injections. This bore out and explained the work of other investigators who found that rickets can be induced in young animals by feeding them an excess of cereals or by adding extracts of cereals to a diet which did not produce rickets in control animals.

Dr. Mirvish suggests that rickets may prove to be a sign of underactivity of two small glands in the neck, known as the parathyroids, and thought by some authorities to have an important relation to the supply of calcium in the blood. If this is the case, our present conception of the rôle of vitamin D and probably of the other vitamins will have to change very appreciably.

## ULTRA-VIOLET WINDOWS

How to let the ultra-violet rays of the sunlight through the window into home and schoolroom was recently discussed by Dr. W. W. Coblentz, physicist of the U. S. Bureau of Standards at Washington, in a report to the Illuminating Engineering Society. He reported his tests upon various window glasses and other materials and suggested that for effective results the material should not transmit less than 45 to 50 per cent. of the ultra-violet rays in the sunlight.

If only small amounts of the ultra-violet rays penetrate the windows they can not be relied upon to effect cures of rickets, which are possible with large doses of ultra-violet rays as well as with sources of vitamin D. Dr. Coblentz quoted clinical reports that indicated that exposures of five to seven hours each day with light through glass with 25 per cent. transmission would be necessary merely to prevent rickets in a normal, properly fed child, and in view of the fact that such exposures of such lengths are not practicable, he believes that at least 45 to 50 per cent. transmission must be required in specifications. Even with this degree of transmission, the effect would be preventive only and in no sense curative.

Various commercial makes of glasses, after being stabilized by exposure to sunlight, ranged from only one half of one per cent. to 59 per cent. transmission, with four out of nine greater than 40 per cent. Dr. Coblentz used a wave-length of 302 millimicrons as a division point between the ultra-violet rays and the rest of the sunlight.

Tracing cloth, which has been suggested for window material because of a supposed transparency to ultra-violet rays, was found to be actually no more transparent than other fabrics such as nainsook, batiste or balloon cloth. Other studies of fabrics showed that those made of silk and wool yarns compared favorably in transmission of ultra-violet light with cotton, linen and rayon.

Feathers have a fairly high transmission, apparently nature's provision for assuring chickens and other birds their supply of these vital rays. Unlacquered surfaces of metals, aluminum, nickel and chromium are good reflectors of ultra-violet radiation. Linseed oil and nitrocellulose lacquer, especially after drying, are highly opaque to ultra-violet radiation.

## THE EUROPEAN PINE-SHOOT MOTH IN FLORIDA

THE European pine-shoot moth, first reported in the United States fifteen years ago, has been discovered in Florida by Perkins Coville, of the U. S. Forest Service. The insect was identified by August Busck, U. S. National Museum specialist on lepidoptera.

Up to this time the European pine-shoot moth has never been recorded south of Washington, D. C. It was first discovered in Long Island, and later spread to the Middle Atlantic States and through the New England States to southern Canada. In the North it seems to confine itself in general to the ornamental trees, and for that reason has not been a serious pest. In parts of Europe, however, it is very serious. It is feared that it may prove very harmful should it get firmly established in the South because of the fact that the long growing season may enable the moth to develop four or five generations a year.

The specimen identified by Mr. Busck was found infesting immature cones taken from a long-leaf pine growing near the Starke, Florida, branch of the Southern Forest Experiment Station. The tree had been used in cross-pollination experiments and removal of pollination bags from the flowers had disclosed the fact that a number of small cones were badly infested.

Mr. Coville describes the larva or caterpillar of the European pine-shoot moth as dark brown, with a deep black head and a black shield on the upper part of the first division of the body behind the head. Allied species are lighter in color. The full-grown larva is two thirds of an inch in length.

The Department of Agriculture has made the request that every one in a position to do so watch for signs of the insect and its damage and send any material showing symptoms resembling the description of the pine-shoot moth infestation to the Bureau of Entomology of that department at Washington, D. C., for examination and identification.

## THE HAWAIIAN VOLCANOES

HUALALAI, the Hawaiian volcano for which Dr. T. A. Jaggar has predicted possible eruptive activity within a month, is normally one of the quietest of all volcanoes known to be active. In a statement to *Science Service*, Dr. Harry Washington, of the geophysical laboratory of the Carnegie Institution of Washington, himself a leading authority on the ways of volcanoes, called attention to the fact that during the known history of the Hawaiian Islands, Hualalai has had only one lava flow of major proportions, and that was over a century and a quarter ago, in 1801. Then the lava broke forth from a secondary vent on the side of the mountain and flowed in a widening fan-shaped stream to the sea.

Hualalai lies at a considerable distance from Kilauea, most active and best-known of Hawaii's volcano family. It is situated in the western part of the island of Hawaii, about sixty miles from Kilauea, which stands in the southwestern part. It is about twice as high as Kilauea, rising to an elevation of some 8,200 feet and bearing several well-marked cones on its summit, as well as a number of craters on its slopes.

Mauna Loa, which Dr. Jaggar has warned may join Hualalai and Kilauea in a great triple eruption to relieve the swelling lava tide now rising beneath the island, is the highest of the active volcanoes in the Pacific area, its peak rising to 13,650 feet. This mountain, however, is topped by the towering but extinct Mauna Kea, northeast of it on the same island, which has a height of 13,825 feet.

The action of the Hawaiian volcanoes, Dr. Washington said, is relatively quiet in spite of the massiveness of some of the lava flows. Devastating steam explosions, such as that of Mt. Pelée which almost wiped out the population of Martinique in 1902, are unknown. Explosive activity, filling the air with volcanic ash and hot sand when violent, is limited in Hawaii to a minor rôle.

The main energy of the Hawaii volcanoes is spent in the upwelling of great fountains of lava, which usually burst forth from their sides rather than their tops, and roll in streams toward the sea. These are of course exceedingly destructive, wiping out plantations and villages, but at least they give the inhabitants time to flee to safety.

## THE PAN-AMERICAN INSTITUTE OF GEOGRAPHY AND HISTORY

THE task of publishing a geography and history of all the Americas is to be one of the first undertakings

of the new Pan-American Institute of Geography and History. This ambitious and important work is expected to be completed by 1935.

The institute, which held its first organization meeting in Mexico City recently, has elected as its active president Dr. Salvador Massip, professor of geography at the University of Cuba. Its honorary presidents are to be Dr. William Bowie, of the U. S. Coast and Geodetic Survey, and Dr. J. Toribio Medina, historian, of Chile.

The institute will study the prehistory of the Americas, the archeology, the history of the Colonial epoch, and events in recent centuries. The geographic studies will include topography, geodesy, cartography, geomorphology, human geography, ethnography and historic, biologic and economic geography. A library of maps, books and other data will be created in the institute's headquarters.

The new institution is to be of international usefulness in providing data on meteorological conditions for Pan-American air routes and in studying disputed boundary problems.

Dr. Bowie outlined the significance of the new organization as follows: "We have heard so much of the application of science to agriculture, industry, commerce and communication, but science can only go so far in bettering conditions of humanity without geographical knowledge. The geographer must aid the chemist, the physicist and the engineer, in efficiently utilizing the resources of nature. Civilization will greatly advance by an early mapping of the world. Maps are still very imperfect. Although much mapping has been done in the United States, only 43 per cent. of the area has been topographically surveyed, and many of these map sheets were inadequately made and do not serve the purposes of agriculture, mining, the development of hydro-electric projects, systems of communication and transmission of power to-day. The Western Hemisphere is new to civilized man, and we must develop and utilize its natural resources as our present needs demand, but without impoverishing the generations to come. In this discreet development and utilization of natural resources, the geographer must play an important part, and the Pan-American Institute of Geography and History can exert a great influence in outlining general geographical problems to be solved, and in disseminating geographical data already existing but not widely known."

## ITEMS

THAT undulant fever, one of the newest diseases of man, is widespread throughout the United States, is shown by a survey made by the U. S. Public Health Service. For some time this disease, variously known as Malta, Mediterranean or undulant fever, and acquired from the milk of infected cows or goats or from other infected cattle, was thought to be confined to one or two western states. The survey showed that only West Virginia and Wyoming have not had any cases reported during the five-year period covered by the investigation. The number of cases reported throughout the country has been steadily climbing from 24 in 1925 to 649 in 1928. For 1929 only 366 cases have been reported thus far. Wisconsin, New York, Ohio, Pennsylvania, South Carolina, California, Illinois, Minnesota and Iowa reported the greatest number of cases in 1929. The disease is characterized by long continuation with many periods of apparent recovery and subsequent relapses. High fever with rheumatic and neuralgic pains occur, but the disease is not often fatal.

LEAD, tin and stainless steel offer the most resistance to corrosion when exposed for years to the air, Dr. J. Newton Friend, head of the chemistry department at the Birmingham Technical College, in England, has found in a series of researches upon which he reported at the meeting of the Institute of Metals. A number of cylindrical bars of different metals, each two feet long and an inch in diameter, were exposed on a Birmingham roof for seven years. Various kinds of brass were most corroded, though they passed the test much better than specimens of wrought iron and carbon steels. Aluminum resisted corrosion nearly as well as the lead and tin, though near a body of salt water this would not have been the case.

A LAKE that is deeper than it is wide has recently been investigated by Russian geologists. It lies about 40 kilometers south of the health resort of Nalchik in the North Caucasus, and is known as Cerik-köl, or the Blue Lake. It is only a small body of water, being 235 meters long and 130 meters wide; but it has the surprising depth of 258 meters, with practically vertical walls. Except at its surface, the water temperature remains constant the year round, at about 17 degrees Fahrenheit higher than the average annual temperature of the air. The lake has no surface inlets, not even the smallest of brooks, but a little river flows out of it. The water is presumed to come from subterranean springs. The lake is charged with hydrogen sulphide and also contains gypsum, so that nothing can live in it. There are never any leaves or pieces of driftwood to be found on its surface, which has given rise to the local superstition that nothing can float on its water. The people of the neighboring highlands also have the belief that the mysterious depths of the lake are inhabited by a monster in the form of a bull.

THE art of weaving was known to the Indians who built their mounds in Indiana centuries ago, as it was to their compeers of the Hopewell area in Ohio and to the greatly different Indian civilizations of the Southwest. On opening a leather pouch containing a number of copper bracelets excavated from the mound he is exploring at Winchester, Indiana, F. M. Setzler found three layers of woven cloth. The Indians knew how to make more than one kind of fabric, for part of the material was finely, part coarsely woven. Very little woven work by mound-builders has come down to us, because in the damp earth of the mounds it had no chance to be preserved from decay. The pieces which have been recovered have, without exception, been preserved by contact with copper objects, which formed verdegris, checking the action of fungi and bacteria of decay.