ENDOCRINOLOGY

Growth Hormone Isolated

Substance obtained from pituitary appears to be pure, since tests on rats showed it stimulated growth but had no other effects. Is a protein.

➤ ISOLATION of the growth-stimulating hormone from the pituitary gland, best known to the public through circus giants and dwarfs, is announced by Dr. Choh Hao Li and Dr. Herbert M. Evans, of the University of California. (*Science,* March 3)

Many extracts of a growth-stimulating substance have heretofore been obtained from this gland but apparently none of them has been the hormone itself completely free from other chemicals or hormones produced by this gland.

The California scientists report that the substance they have isolated appears to be a single substance and that it is a protein. Tests on rats showed that it stimulated growth but had no effect on the mammary, thyroid, adrenal or sex glands which indicates that it is "substantially free of other biologically active pituitary contaminants."

Over-production of this growth hormone by the pituitary gland results in giants or in the gorilla-like transformation of the disease, acromegaly. When the pituitary gland disorder goes in the opposite direction, so that too little growth hormone is produced, the result is dwarfism. Not all dwarfs, however, owe their small size to underactive pituitary glands.

Science News Letter, March 11, 1944

MEDICINE

Onion Paste Helps Wounds

Vapors of bacteria-killing substances in oils of common vegetable, applied as a dressing, speed healing of amputated limbs and clean up infection.

➤ PROMISING results with onion paste used as a dressing for infected wounds are reported by Dr. I. V. Toroptsev and Dr. A. G. Filatova, of the Tomsk State University and the All-Union Institute of Experimental Medicine, USSR. (*American Review of Soviet Medicine,* February)

The experiments with onion paste as a weapon against infection and an aid to healing of wounds followed reports by Dr. B. Tokin, that the essential oils of onions, garlic and other certain strong-scented vegetables contain substances that kill bacteria, protozoa, and even larger organisms like yeast cells and the eggs of certain lower animals. (*See SNL,* Feb. 12)

The bacteria-killing substances are called phytoncides. They have not yet been identified chemically, but are extremely volatile, so that the paste has to be made immediately before use. The preparation consists simply in grinding the onion or a portion of it after the dry leaves have been removed. The paste is then put into a glass dish with a diameter equal to that of the wound and is applied so that the paste does not come in contact with the wound, which is exposed only to the onion vapor.

Vaporization, as the treatment is called, is done for 10 minutes, usually in two five-minute intervals with a fresh onion paste each time.

At first the experiments were tried with 25 patients but lack of onions forced the doctors to limit themselves to 11 patients. Of these, seven had amputations of the arm, one of the thigh and three of the foot. Before treatment all the extremities showed distinct purulent inflammation, in some cases with a marked odor, as well as swelling of the soft tissues. Some patients complained of pains in the amputated areas.

After the first phytoncide treatment, the doctors report, all the wounds without exception became rose-colored instead of gray, and the patients no longer complained of pain. After the second treatment the pus condition subsided and the odor disappeared. After five days all the cases showed extensive soft epithelialization.

Positive results, with growth of new tissue and wound healing, did not occur in all patients. However, the Soviet scientists seem to feel that phytoncides have a place in treatment of infected wounds along with synthetic preparations such as the sulfa drugs.

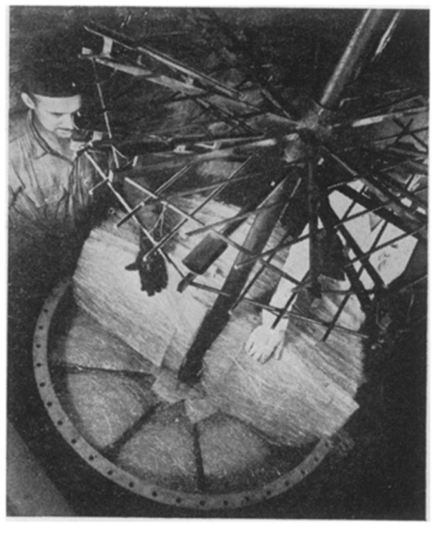
They call attention to reports of other scientists that the juices of oranges, tomatoes and coniferous plants have a healing effect on wounds. These reports have attributed the healing effects to the vitamin content of the juices. The Soviet scientists believe it is more likely due to the phytoncides in the juices.

Science News Letter, March 11, 1944

CHEMISTRY

Glass Fibers Very Strong In Proportion to Weight

➤ GLASS FIBERS are stronger in proportion to their weight than any known metal or alloy. Their tensile strength exceeds 250,000 pounds per square inch for the finer fibers. A wartime development is the use of these fine fibers as reinforcement for plastics to produce a structural material possessing hitherto unobtainable strength in proportion to weight.



VERSATILE — Another use for glass, in the form of fibers 85/10,000 of an inch in diameter, is in the production of alcohol as packing for distillation columns, replacing critical materials. The picture shows the packing process at the Tom Moore Distillery, Bardstown, Ky. The glass fibers used are manufactured by the Owens-Corning Fiberglas Corporation.

Glass fibers will melt, but they will not burn. They will not absorb moisture. They will not stretch, swell or shrink, and are unaffected by most chemicals. They offer low resistance to the flow of vapors.

Extremely fine fibers are twisted and plied into yarns which are used to weave fabrics that must withstand heat, damp and decay. Somewhat larger fibers, treated with a binder, are fabricated into blankets and boards used for heat and sound insulation. Or, treated with a binder and pressed into wafer-like sheets, they are used as retainer mats in storage batteries to give them longer life. The coarse fibers, coated with an adhesive, are used to filter dust and pollen from the air circulated by air-conditioning and heating systems.

Processes of manufacturing Fiberglas differ according to the type of fiber to be produced. The basic method, however, is to attenuate fine streams of molten glass as they flow from tiny holes in the melting furnace, drawing them out with a high-speed winder or with high-pressure jets of air or steam.

So that you can see and feel different types of Fiberglas, some soft as milkweed and others quite coarse, kits have been prepared by Science Service. The Glass Fiber Unit of THINGS of science can be secured by sending 50 cents to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. and asking for unit No. 40.

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METEOROLOGY

Long-Range Forecasting

Weather predictions far into the future are practicable from measurements of solar radiation changes, head of Smithsonian Institution declares.

➤ LONG-RANGE weather forecasting, based on accurately made measurements of variations in the radiant energy received by the earth from the sun, are now practicable, Dr. Charles G. Abbot, secretary of the Smithsonian Institution, declared in Washington in the Twelfth Arthur Lecture of the Institution.

Dr. Abbot told of successful trial forecasts made by himself during recent years. In one, made at the request of a colonel of engineers, he predicted that the rainfall in the Tennessee Valley during a given three-month period would be between 84% and 87% normal. As subsequently measured during the period covered, it was actually 87% normal.

On the basis of what appears to be a general tendency for the weather in a given locality to repeat itself about every 23 years, Dr. Abbot made what might be termed forecasts after the event for a number of American cities, and compared them with the records of actual weather. The fit between the curves for predicted and actual weather for Peoria, Ill., he considers especially good, and on the strength of this he has laid down a continuation of the prediction-curve to indicate what the weather should be there for the balance of 1944. This curve of the future shows 1943 ending with a severe drought, which is expected to continue until well into spring, and then break sharply with a return to normal rainfall for that locality.

Last year he undertook a forecast for Washington, D. C.: "In March, 1943, I informed the Chief of the Weather Bureau that on a certain list of dates the average daily precipitation would be higher than on the remaining dates of the year. On the basis of my calculations, the selected dates were expected to show 1.66 times the average rainfall of the nonselected dates. The actual ratio, for the 175 selected dates compared to 191 nonselected, was 1.58."

Finally, for the farther future, Dr. Abbot predicted that great droughts in the Northwest in the years 1975 and 2020 will result in serious lowering of the water level in the Great Lakes.

As background for so bold an undertaking as the forecasting of weather on the earth by a study of conditions on the sun, Dr. Abbot reminded his listeners of the sun's enormous power as a radiator of free energy. The 8,000-mile circle represented by the earth's diameter, at a range of 93,000,000 miles, is incessantly receiving from the sun the heat equivalent to a quarter of a quadrillion (250,000,000,000,000) horsepower.

But this radiation is not steady and unvarying. There are fluctuations in the rate of reception. Little is known of their causes, but Dr. Abbot has identified not less than 14 cycles, or rhythmic curves of ups and downs, which the instruments maintained in three different parts of the earth by the Smithsonian Institution have measured in solar radiation.

As one fairly direct cause of departure from the average, Dr. Abbot called attention to the way sunspots operate. Each sunspot pours out a great conical spray or jet of electrically charged particles, like a stream of minute bullets from a gigantic machine gun. These sweep in vast circles as the sun makes its 27-day revolutions on its axis. These streams of particles have a scattering effect on the light that strikes them, so that when one sweeps across the earth there may be a drop of from 1% to as much as 5% below normal in the day-

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