SCIENCE NEWS

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SYNTHETIC SUGAR

Special Cable to Science Service

A PROCESS for manufacturing sugar out of wood, which Professor Friedrich Bergius, of Heidelberg University, has worked out in the laboratory, has now reached a state where it may be utilized in industrial production on a large scale. A large factory to carry out the process is being erected near Geneva, Switzerland, by the International Sugar and Alcohol Company of London. It is estimated that an acre of forest land can be made to yield as much sugar as an acre of ground planted to sugar beets, and the new process has the advantage in that it can be carried out completely and continuously by machinery without the employment of the manual labor and the length of time necessary for crop production.

The synthetic sugar, however, is not the same as the sucrose made from beets or cane, but is rather like the glucose now made in America by the action of hydrochloric acid on corn starch. Glucose is not so sweet as sugar but is equally nutritious. The product of the Bergius process comes out in the form of a greyish powder, containing ninety-five per cent. sugar. This can be used directly for cattle food or be purified for human use.

The process consists essentially in adding a molecule of water to each molecule of the cellulose of the wood pulp, which converts it to glucose. This is accomplished by treating sawdust with forty per cent. hydrochloric acid in containers specially constructed of acid-proof and heat-proof materials. Earlier efforts to effect this transformation economically were frustrated because the acid was used in dilute solution, and afterwards, in driving off the excess of water, much of the sugar decomposed. In the present process the acid is recovered in concentrated form ready for renewed use without the expense of distillation. The necessary heat to evaporate the water from the mixture is introduced by the injection of hot vapors of mineral oil. This does not absorb the volatile acids and does not mix with the sugary solution, but floats as a layer on top and so can be easily separated. The oil is reheated and run in with more of the sugar cellulose solution.

The Bergius process for synthetic sugar was patented in the United States on July 28, 1926.

THE SOLAR ECLIPSE VISIBLE IN ENGLAND

ACTIVITIES of astronomers, both amateur and professional, in the United States in the autumn of 1924 are now being duplicated in Great Britain, for next June the track of a total eclipse of the sun will cross England from Southport to West Hartlepool. This is the first total eclipse path to cross England since 1715 and 1724, and the last for at least 200 years more, according to Professor H. H. Turner, F.R.S., professor of astronomy at the University of Oxford.

In order that the British public may realize the rarity of this event Professor Turner and other astronomers, with the cooperation of the British Astronomical Association, are distributing information about it. Thus they are following the example set by Edmund Halley, after whom Halley's Comet is named, at the time of the 1715 eclipse.

At that time Halley wrote: "The like Eclipse having not for many ages been seen in the Southern Parts of Great Britain, I thought it not improper to give the publik and Account thereof, that the suddain darkness, wherein the stars will be visible about the Sun, may give no surprize to the people, who would, if unadvertized be apt to look upon it as ominous, and to interpret it as portending evill to our sovereign Lord King George and his Government, which God preserve."

The eclipse of next year occurs on June 29 and, for observers in England, begins shortly after the sun has risen. Totality, when the moon completely obscures the sun, occurs about 5:30 a.m. The duration of totality is even less than that of the eclipse that crossed New England on January 24, 1925, for the English totality lasts about 25 seconds. From England the eclipse crosses the North Sea, and then north over Norway, in the northern part lasting about 45 seconds. Then the path leaves the northern coast of Norway, crosses the Arctic Ocean, northeastern Siberia, and finally the Aleutian Islands, ending just south of them, where the sun sets half eclipsed.

Most of the astronomers who observe the eclipse for scientific purposes will probably go to Norway to take advantage of the extra length of totality, but in England there will also be a large number of observers.

Professor Turner requests the public to cooperate in the observation of the eclipse by noting as precisely as possible the time of beginning and end of totality, when the sun's corona is visible, and also noting what stars are visible around the sun.

Unfortunately, clear weather at the time of the eclipse is not assured, but, says Professor Turner, "everyone ought to go ahead just as though fine weather were assured. During the war, astronomers felt that they ought to observe the eclipse of 1919 for the Einstein effect, and they went ahead just as though the war were certain to be over in time, though it looked quite hopeless. That is the only reasonable way."

THE VITAMINS OF COD-LIVER OIL

IF the cod-liver oil bottle is allowed to stand too long on the bathroom window sill in the sunshine it is not nearly so worth while to make the baby swallow his daily dose. It will have lost its famous properties to make the young idea "grow big and strong," the inducement held out to down the oil that is an unappreciated part of the bill of fare of most present-day youngsters.

Dr. P. R. Peacock, of the Middlesex Hospital, London, has discovered that the growth-promoting vitamin A is destroyed by prolonged exposure to sunlight or to irradiation by ultra-violet light. He was led to make this discovery on finding that a bottle of cod-liver oil that had remained on his work bench several months had lost its fluorescent properties when exposed to ultra-violet light.

Chemical tests failed to show the presence of vitamin A, but the fluorescence returned when the bottle was kept in the dark, though the chemical tests for the vitamin continued negative. The "deluminated" oil, as Dr. Peacock calls it, was likewise proved lacking in growth-promoting powers when fed experimentally to rats.

Though the deluminated oil has no vitamin A, vitamin D, which prevents rickets, is quite unaffected by the action of ultra-violet light or sunlight.

A similar discovery has been made in the United States by R. W. Titus, J. S. Hughes, W. R. Henshaw, and J. B. Fitch, of the Kansas State Agricultural College. They have found that ultra-violet light also destroys vitamin A in cow's milk.

This demonstrated instability of the growth-inducing vitamin, according to Dr. Peacock, makes it very desirable to pay careful attention to the way in which foods which owe their value to its presence are stored.

VACCINE FOR TUBERCULOSIS

SAFEGUARDING the babies is the line along which the French have made outstanding progress in cutting into the tuberculosis death rate.

Tuberculosis inoculation has reduced infant mortality to less than one per hundred during the first years of life, according to Dr. Weill-Halle, of the College of Medicine at the University of Paris, who addressed health workers attending the National Tuberculosis Association meeting in Washington last week. The mortality of children of the same age who had not been vaccinated and reared under the same conditions in tubercular families, declared Dr. Weill-Halle, was at least twenty-five per hundred.

The tuberculosis vaccine used on the babies in the Paris slums was the famous BCG originated by Professor Albert Calmette, of the Pasteur Institute. The vaccine is not a cure for the disease but careful experiments with calves and monkeys, as well as babies, show that vaccinated individuals will not contract the disease even when in close contact with severe cases for a period of three years or longer.

Cooperation with physicians and medical workers in other countries have enabled the French scientists to collect enough data from wide-spread sources to establish definitely the two facts: that the process is harmless and that it does protect new-born babies from contracting the disease from tubercular mothers. Only the new-born are inoculated, said Dr. Weill-Halle, and that during the first few hours of life. Infants have been so treated in France, Great Britain, Belgium and Sweden with equal success.

A BRAZILIAN RUBBER TREE IN FLORIDA

CONSIDERABLE excitement has been aroused among the rubber experts of the U. S. Department of Agriculture over the discovery by O. F. Cook, rubber expert, of a twenty-five-year-old Brazilian rubber tree growing in a yard at Palm Beach, Florida. While they decline to state that this indicates the possibility of large-scale rubber plantation operations in the United States proper, the mere existence of this tree so far out of the equatorial zone hitherto thought to be its only possible home gives rise to suggestions which they think should be acted upon at once.

In its native home in the Amazon valley, as well as in the plantations of Indomalaya, the Brazillian rubber tree sticks very close to the equator, where the normal cool nights and the occasional frosts of the Florida climate are unknown. Experimental plantations of rubber seedlings in Florida twenty years ago all came to grief, and last winter an unusually severe cold snap injured most of the seedlings at the Department of Agriculture's experimental farm at Coconut Grove, and killed a part of them outright. It has therefore been assumed that the Brazilian species is extra-sensitive to cold and would not survive in even a subtropical climate. To all this, the discovery of a twenty-foot-high tree, with a trunk between three and four inches thick, has proved very upsetting.

An outcome of this indication of hardiness on the part of at least some of the Brazilian trees, of more practical and immediate importance than attempts to grow rubber in Florida, will be the investigation of the possible adaptability of the species for cultivation in the border-line tropics, such as Mexico and the West Indies. There is already some indication that Hevea, the Brazilian tree, is hardier than the Mexican rubber tree, Castilla, for last winter's frost at Coconut Grove had worse effects on Castilla seedlings than it had on seedlings of Hevea in neighboring rows.

In the meantime the department is instituting a search in other parts of Florida for Hevea trees similar to the Palm Beach specimen which people may have set out as ornamentals. They point out that the Palm Beach location is not the best kind of habitat for the species since Hevea is predominantly a tree requiring shelter, and that the inland hardwood groves, or "hammocks," would afford this better than a coastal location swept by sea breezes.

THE SAN BLAS INDIANS

IF the San Blas Indians of Panama could be left alone for the next few centuries, they might develop a unique culture, like the famous Maya of Yucatan. But this interesting scientific experiment has little chance of taking place, since alien tribes are steadily encroaching on the land occupied by the San Blas.

The situation among these Indians, who have become widely known in this country through the visit of the "White Indians" of their tribe, is described by Herbert W. Krieger, ethnologist of the U. S. National Museum, in a new government publication on the people of southeastern Panama.

The San Blas, who are a link between the Peruvians and the Maya in their characteristics, have not amalgamated with other tribes since very early times. Watchmen of the tribe guard the coast and trail any strangers who come to a native village, and any attempt to stay over night is discouraged. But the Panamanians are trying to force this independent and self-sufficient group to accept their government and to send their children to school, and it is only a matter of time before they will give in and will blend with other tribes.

The only measure which might enable the San Blas to remain isolated would be to establish a reservation. And while this might solve the problem to the satisfaction of the San Blas so far as science is concerned it would really come too late for the tribe to develop its own culture, since they trade with the Negro and other foreigners, and are absorbing alien ideas.

"The reason why they have not perfected a system of writing, a calendar, or other development of a high civilization may be that they have never gathered into large communities," Mr. Krieger believes. "Instead, they live in small villages off the islands of the Panama coast, and commute to the mainland where they cultivate plantations.

"The first step toward a system of recording time is shown in the turtle calendar of the San Blas. This consists of a stick worn around the neck, with which to keep account of the time of hatching of the turtle eggs. When a turtle comes ashore to build its nest, the Indian fisherman begins cutting notches in the stick until 14 days have gone, when he knows the turtle will again come ashore to visit its nest and the eggs can be taken from the nest and eaten."

The beginnings of an alphabet may be seen in their system of mnemonic or memory writing which is a highly developed form of picture writing intelligible to the initiated and used to record lore concerning treatment of disease, religious practices and tribal history.

Mr. Krieger's new publication on the culture of the people of southeastern Panama is intended chiefly to catalogue and describe the National Museum's fine collection of over 1,000 objects from that region.

HEREDITY IN MAN

Is a time coming when scientists will be able to tell prospective parents what kind of children they will have? If they can, it will only be after expenditure of large sums, not only to collect the necessary data about the physical and mental traits of each individual citizen and his ancestors, but to keep the information recorded where it can be used.

"It is a reproach to science that studies on the laws of heredity in man have been so long neglected," according to Dr. C. B. Davenport, of the Genetics Laboratory of the Carnegie Institution of Washington, in a report to the American Medical Association on the probabilities of inheritance of disease.

"The reason for this neglect is, however, obvious. It is the great expense involved in making these studies on human beings where control of matings is impossible. The method of study, under these limitations, is clear. One must go to the families in which the traits that we are studying are found and see of what kind are the matings that have brought them about. This study involves much travel on the part of many collaborators and careful analysis of the results.

"On account of the practical nature of the results which are certain to flow from such investigation, it should be carried out even though the cost of the research will be considerable. Man suffers incalculable loss through ignorance of the method of inheritance of these traits, which mean so much to the health and welfare of the people in this and other countries."

ITEMS

PEOPLE are more likely to contract tuberculosis from inhaling infected dust than they are through encounters with coughing patients in the active stages of the disease, according to Dr. Friedrich Neufeld, director of the Koch Institute at Berlin. Physicians present at the annual meeting of the National Tuberculosis Association being held recently heard Dr. Neufeld describe his experiments to ascertain the most significant sources of tuberculosis infection. More "Spitting prohibited" signs would seem to be the moral of the German scientist's results. His researches indicate that dust, either breathed in or picked up on the hands and containing dried-up but active germs, causes more tuberculosis than inhaling the droplets from the cough of a tuberculosis patient. Many persons may have the disease in a latent form and be quite unaware of the health menace they present to the world at large.

LICENSING travelers through forests, as a means of protecting Canada's timber wealth from the ravages of fire, is advocated by the Canadian Forestry Association. Rolson Black, editor of *Forest and Outdoors*, believes that a forest is potentially almost as dangerous as a powder magazine and advocates the issuance of travel permits, without which no one would be permitted to travel through any forest region during those seasons when there is danger from forest fires. The advantage of this system would be twofold. The formality of securing a permit would bring forcibly to mind the real dangers of forest fires, and since a permit can be revoked the possibility of forfeit would make the traveler careful. The preservation of Canadian forests would assure to Canada an annual income of half a billion dollars for all time to come.

A LUXURIANT orchid garden containing 7,000 plants and representing many species of the tropical flower has been taken over by the Missouri Botanical Garden from C. W. Powell, of Balboa. Mr. Powell has made a special study of the orchids of Panama and has more than doubled the number of species formerly known from that country, besides discovering more than a hundred species previously entirely unknown to science. The orchid garden will be maintained in the Canal Zone as an experimental tropical garden.