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FOOD EXPOSED TO SUNSHINE CURES RICKETS DISEASE

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Foods given a sunbath are as effective in preventing and curing rickets as foods rich in the anti-rachitic vitamin, Dr. Harry Steenbock, professor of agricultural chemistry at the University of Wisconsin, has discovered.

As a result of experiments he has found that merely placing food in the sunlight will endow it with growth promoting properties supposed to be possessed only by food rich in vitamins, in spite of the fact that "irradiated" or "illuminated" foods may contain no vitamins before exposure to the light.

"Hundreds of rats have been used for these experiments," Dr. Steenbock explained. "Rickets was produced in these animals by first feeding rations known to produce this disease. Then they were cured by feeding them with exactly the same ration which had been exposed to sunlight.

"For man these findings have particular value because prominent medical authorities have found that in northern climates, 40 to 90 per cent. of the children in industrial areas show signs of rickets. Such a condition, while seldom fatal, leads to more or less permanent abnormalities such as bowed legs, deformed chests, and poor teeth, due to the inability of the child to assimilate lime. In the nursing mother also there often results a like condition indicated by wastage of lime leading to loss of teeth and broken bones."

By exposing them to sunlight, cereal grains, breakfast foods, salad oil, cooking fats, oleomargarines, and modified infant foods may all be made protective agents without affecting their taste, and apparently this property is not destroyed by aging.

In the past cod liver oil has been the standard remedy for rickets, but as a result of Dr. Steenbock's experiment it may become possible to dispense with cod liver oil, a remedy which has been tolerated rather than relished. Olive oil and lard, as well as other plant and animal fats, can be made as active as cod liver oil by Dr. Steenbock's method.

"Rickets is rarely found in the tropics because direct illumination with sunlight acts as a preventative," Dr. Steenbock said. "But with the infant in northern climes, direct exposure to sunlight is almost impossible for a considerable portion of the year and sunlight filtered through glass is of no value. Dietetic treatment, therefore, is necessary as a part of the daily ration. Activated oils may be given as medicine or they may be incorporated in modified cow's

milk. For the adult the same may be accomplished by using activated oils as salad dressings or otherwise.

"Whether this will have its application in animal production remains to be seen. Chickens suffer from 'leg weakness', pigs from 'neuritis', and cows from wastage of lime during periods of heavy milk production. Probably direct sun - light treatment will there be found more practical."

Dr. Steenbock's discovery grew out of the work of other investigators, who had found that animals fed on foods poor in vitamins would grow normally if kept in the sun, while "check" animals fed on the same foods and kept in the shade failed to grow. They had also found that if the livers of "sunned" rats were fed to "shaded" rats, these stunted cannibals gained the power of growth from the remains of their departed brethren.

Dr. Steenbock tried putting "sunned" and "shaded" rats in the same cages and learned that even this slight contact transferred the power of normal growth to the less fortunate individuals.

Finally he took the regular anti-rachitic free ration that served as a basis for the diets used in his experiments, and instead of adding vitamins simply set it in the sun. Rats fed upon this "irradiated" food grew just as well as those that received a dose of anti-rachitic substance, while the "check" or "control" animals, receiving neither vitamins nor "irradiated" food, failed to thrive.

To protect the interest of the public in the possible commercial use of these findings, applications for patents, both as to processes and products, have been filed, and will be handled through the University of Wisconsin.

SEEKS BOUNDARY LINES OF VANISHED NATION.

The Bureau of American Ethnology of the Smithsonian Institution has set for itself the task of digging up the far flung boundaries of a vanished nation - one of the most mysterious in history. This is the Creek Confederation which, in the opinion of Dr. J. Walter Fewkes, director, once embraced the territory of Florida, Georgia, Mississippi, Alabama, Arkansas, Louisiana, and possibly East Texas.

Dr. Fewkes plans to follow the trail of the ill fated Spanish explorer, De Soto, discoverer of the Mississippi. Records left by followers of De Soto who finally escaped from the deadly tangles of the southern swamps tell of a large number of palisaded towns inhabited by a tribe with a high degree of culture. There is a possibility, Dr. Fewkes, believes, that most of the trail led through the territory of the confederation.

They were mound builders and sun worshippers. Some of their pottery which has been taken from the mounds indicates an artistic and cultural development higher than any other in North America previous to the coming of the white men. Little is known of the political system which bound the great confederation of allied tribes. Equally mysterious is their origin and their final fate. There is every indication, says Dr. Fewkes, that the confederation was in its last stages when it came under the observation of De Soto and his men.

The carvings left by the various tribes indicate a possible relationship with the Aztecs and some scholars of pre-Columbian history have jumped to the conclusion that they were a closely related people. This is questionable, Dr. Fewkes says. Even if it should prove to be the case, he claims, it is doubtful whether they had attained the same degree of culture as their Mexican brethren who had the advantage of contact with the Mayas. There is evidence, however, that they were a superior people to the Six Nations. They were aggressive and warlike, as De Soto found to his sorrow.

Discoveries nearly every year indicate that the territory of the confederation was very extensive. Recent excavations in central Tennessee have brought to light the palisaded towns and sun palaces of either the same or a very similar people, constructed with a remarkable degree of engineering accuracy.

Dr. Fewkes plans to have expeditions dig at selected points along the supposed boundaries of the state in an effort to bear out his theory. He himself intends to return soon to the western coast of Florida where he will conduct further excavations. Gerard Fewkes, a special collaborator of the Bureau, is now excavating near the site of Wilson Dam in northern Alabama. Other workers will be given directions in the near future and there is a possibility of unraveling one of the most mysterious chapters in American history, according to Dr. Fewkes.

TO USE X-RAYS IN FRUIT INSPECTION

The use of X-rays in diagnosing diseases of fruits is the latest new idea emanating from the bright end of the Dark Continent. Mr. C. W. Malley, entomologist for the Department of Agriculture of the Union of South Africa, is the originator of the idea. The department, which is anxious to increase the export trade of the country in agricultural products, could do nothing better, in his opinion, than to adopt some method whereby unsound fruit may be entirely eliminated from shipment and thus avoid financial loss to the farmers as well as the danger of enactment of severe if not prohibitive legislation on the part of foreign countries.

What suggested the use of X-rays in detecting internal defects in fruits, was the common custom of candling eggs to determine spoilage. Common light can not be used in the case of fruits as it could with eggs, but X-rays can. It is possible by this scheme to detect injuries caused by the fruit-fly larvae which had matured and escaped, leaving no external signs of injury. Damage done by the codling moth, a pest that is very destructive to fruit in the United States also, can be plainly detected in pears submitted to the X-rays. Defects in oranges due to blue-mold are likewise possible of diagnosis.

Opinion as to the practicability of this method is to the effect that it is only a question of providing suitable apparatus to the farmers. At present the cost of such inspection would be prohibitive, but it should be easily possible to construct suitable X-ray apparatus for rapid handling of fruit at packing and shipping establishments.

The place of the native American chestnut, now practically wiped out by the blight disease, is being taken over by oaks.

RUSSIA ATTEMPTING TO PRESERVE BISON

The Soviet government is reported to have set aside 200,000 acres in the Caucasus where efforts will be made to preserve Europe's largest quadruped—the zubr, or European bison.

This creature, now almost extinct, furnishes a romantic link with the days when the continent was a great, dark forest, roamed by prehistoric tribes.

He was contemporary with the mammoth and the rhinoceros. The cave men hunted him. He furnished food for the wild ancestor of present day Europeans when they first emerged from the plains of Asia. Caesar's legions encountered the creature in the woods of France and Germany, and exhibited him alive in the Roman amphitheater. He was a favorite prey of the hunting parties of the old tsars.

As in America, the bison could not live in contact with man. Gradually he was pushed back until today the only wild specimens are found in the forests of the Caucasus. The tsars made a few attempts to preserve the species, especially in Lithuania where a park was set aside for them. Following the revolution it is probable that these efforts at protection went for nothing and the unfortunate creatures still further were reduced.

The Caucasus bison, close cousins of the American variety, feed on coarse, aromatic grass, and on the leaves, shoots, bark and twigs of trees.

The Soviet also is trying to preserve wild birds. Wild duck sanctuaries are to be set aside and a "crop rotation" period established in hunting - two closed years to one open.

ANCIENT RUINS FOUND ON MID-PACIFIC ISLES

New light on the old mystery of the origin of the Pacific island races may be shed by recent discoveries on two tiny islands belonging to the United States-- islands whose very existence, let alone their ownership, was unsuspected by most Americans.

The Bernice P. Bishop Museum Expedition working in cooperation with the U.S. Navy has spent many months in a scientific reconnaissance of the chain of small islands extending a thousand miles northwestward from Hawaii, and discovered on the islands of Nihoa and Necker the remains of ancient dwellings. These two islands are eroded remnants of volcanic masses, cliff-bound and without water. The settlements must have been made when life was possible there, and have been abandoned when conditions became unfavorable, no one knows how long ago. Preliminary clearing has brought to light old walls, house platforms, burial grounds and terraced fields. Further excavations are planned.

In addition to the archeological finds, the expedition brought in much data and many specimens of value in the fields of botany, entomology, marine zoology, ornithology and geology.

In Sweden experimental use is being made of an electric tractor for plowing.

FISH KEPT FRESH BY NEW PROCESS

Freezing with carbon dioxide is the new method of fish refrigeration being tested at the Atlantic Biological Station in Canada, according to reports received by the American Chemical Society.

The use of solid carbon-dioxide, it is claimed, has several advantages. The lowering of temperature by this means retards spoiling, and the cooling can be controlled within wide limits. The carbon dioxide also excludes the air while the penetration of the juices of the fish by carbon dioxide gas has an additional preservative effect.

Weight for weight solid carbon-dioxide has twice the cooling power of artificial ice, and it is believed that the cost of production can be kept down to about the same figure.

MORE EARLY TOMATOES UNDER GLASS POSSIBLE

Greenhouse tomato plants can be made to produce more than double the quantity of early fruit when pollenized by hand than when allowed to pollenize by natural methods, experiments conducted at Eugene, Oregon show.

Sixteen hand pollinated early fruiting plants produced an average of 39 per cent. of their total fruit in the first harvest month against 21 plants, naturally pollinated, which averaged only 15 per cent.

The experiments showed that, under normal conditions, from 64 to 70 per cent. of tomato blossoms produce marketable fruit.

FIXES PLACE OF MAGIC IN PRIMITIVE SOCIETIES

By suppressing sorcery and magic the Australian administration of Papua has destroyed the strongest influence that made for law and order in the native society, Capt. G. Pitt-Rivers told the ethnology and anthropology section of the Australian Association for Advancement of Science, according to the recently issued report of the Association.

Capt. Rivers said the principal factors of social integration in primitive societies are: first, the chieftainship, magic and sorcery; and second, the system of exchange of gifts, partly economic and partly ceremonial.

In Papua the installation of the village policeman has undermined the authority of the chief without insuring that the substitute shall be of a type to take his place in the native's estimation.

Alligators are one of the principal enemies of water birds in southern game preserves.

DO HEAT, MOTION AND ENERGY DISSAPPEAR AT ABSOLUTE ZERO?

Is 459 degrees below zero Fahrenheit the bottom of the thermometer scale?

This question has been raised by recent calculations of Drs. Bennewitz and Simon, physicists in the University of Berlin. The peculiar habits of hydrogen at very low temperatures lead to the belief that the substance may have a little energy left even when reduced to the so-called "absolute zero", which is 459 degrees below zero Fahrenheit. The remarkably low melting-point of hydrogen, 434 degrees below zero Fahrenheit points to this conclusion. If such energy exists, there may be heat, and so the logical possibility of a still lower temperature.

Refractory gases like hydrogen and helium contract on cooling at a rate that would make them reach a volume of zero at 459 degrees below zero Fahrenheit, provided they did not liquefy on the way down. Thus the absolute zero has been thought by some to be the point where all heat energy and motion disappear. This view receives some support in the remarkable experiments of the noted low-temperature investigator, Kamerlingh Onnes of Leyden, Holland. After prolonged efforts Onnes has come within about one degree of the absolute zero, but seems to be close to a positive limit. However, no cautious scientist is willing to say that there can be no such thing as a temperature below absolute zero.

"SOUTHPA" KIDS ARE O.K., SAYS PSYCHOLOGIST

Dr. Kate Gorday of Los Angeles after a comparison of the intelligence quotients of the right-handed and left-handed children in a group of 1019 children finds no confirmation of the traditional opinion that left-handed individuals are of left-handed or inferior intelligence. In fact the slight difference in intelligence found by Dr. Gorday was in favor of the left-handed.

But although left-handed persons are not necessarily inferior in intelligence it is probably true that among subnormal individuals there is a big percentage of lefthandedness.

Dr. Gorday finds as other investigators do that there are more left-handed boys than girls and that left-handedness runs in families.

TORTOISESHELL-CATS ALWAYS OF SAME SEX

It has been known for some time that tortoiseshell cats are almost always females, but the peculiar behavior of the tortoiseshell character in breeding has only recently been explained as a Mendelian phenomenon. Mr. F. A. Hays points out in the last Journal of Heredity that the genetics of tortoiseshell cats presents the following points:

Black males mated to yellow females give tortoiseshell females and yellow males. Yellow males mated to black females give tortoiseshell females and black males, although an occasional black female has been known to arise. Black males mated with tortoiseshell females give both tortoiseshell and black females and both yellow and black males. Yellow males mated to tortoiseshell females give both tortoiseshell and yellow females and both yellow and black males. Tortoiseshell males have been known to arise as a sort of rare freak, but they are uniformly found to be sterile.

CANNED SPINACH GOOD SOURCE OF VITAMINS

Spinach, long included as a desirable on diet lists for children, has received a new boost as the result of experiments conducted by Dr. Walter H. Eddy of Columbia University. Dr. Eddy has also shown that the vegetable loses none of its vitamin content in canning, a discovery of practical value in regions where a winter supply of vitamin-containing vegetables becomes very expensive if they must be purchased fresh.

Dr. Eddy found that as little as one-fourth of a gram of raw spinach, or its equivalent in canned spinach, is "amply protective against scurvy in a guinea pig regardless of whether the spinach is processed 70 minutes at 240 degrees Fahrenheit or 120 minutes at 240 degrees. Blanching with steam for one minute or with hot water for two minutes ^{or} five minutes failed to affect this result."

Raw spinach has been shown by other workers to be far richer in Vitamin A, the rickets preventing vitamin, than butter. In Dr. Eddy's experiments canned spinach was shown to possess similar qualities.

Dried spinach, however, was shown to be defective in vitamin B, failing to prevent deficiency diseases in pigeons, and not giving as good results in the promotion of growth in white rats as did fresh or canned spinach.

ABSOLVES DOGS AS DISEASE CARRIERS

Dogs do not carry fleas which transmit bubonic plague, according to the results of experiments conducted by C. E. Pemberton, entomologist of the Hawaiian Sugar Planters' Association.

During the past year or so Mr. Pemberton has caught nearly 3,000 fleas from Hawaiian dogs. In not a single instance has he found a rat flea and, as is well known, it is the rat fleas which carry bubonic plague. Only fleas from infected rats can transmit the disease. The flea found on dogs and cats, he says, is a quite distinct species from the rat, chicken or human flea. The families do not mix well.

Mr. Pemberton believes that the dog has been given an undeserved reputation as a disease carrier, which has resulted in stringent laws against stray canines in some localities.

MOVE TO PRESERVE OLD INDIAN SCULPTURES

Land near the recently discovered Indian rock sculptures or petroglyphs has just been offered to the Dominion government by W. F. Islip as a free gift. It is hoped that this gift will serve as a stimulus toward the acquisition of the nearby lands on which the old sculptures are located and that all can be consolidated into a new national park for the pleasure of tourists and the preservation of the old carvings.

GELATINE IN MILK INCREASES GROWTH

Minute amounts of gelatine added to a milk diet produce marked gains in weight, Thomas B. Downey, fellow at the Mellon Institute of Industrial Research, Pittsburgh, told the American Chemical Society meeting at Ithaca, New York.

Mr. Downey based his conclusions on the nutritive value of gelatine on experiments with white rats.

Those experiments proved that gelatine cannot be used as the sole or major source of protein in the diet but that when fed with proteins of natural food products, such as oats, wheat and barley, it possesses high supplementary value. Fed with corn, peas and beans its cleavage qualities are of little value.

Some of Mr. Downey's rats gained about 15 per cent. more weight for the first three weeks when fed upon gelatinated whole milk than when their diet consisted of milk alone. This also held true when a plain ice cream diet was used.

The value of gelatine as a food product long has been in dispute. It first was introduced as an economy food during the French Revolution when extravagant claims were made for it. Its inability to function as the sole source of protein is due to the absence of certain essential amino-acids in its cleavage products.

By the addition of one per cent. of gelatine to whole milk the total solids are increased from 12.6 to 13.46 per cent. and the protein content from 3.4 to 4.36 per cent.

MODERN SAVAGES LIKE OLD STONE AGE MEN

The natives of the island of New Caledonia, which lies in the Pacific ocean several hundred miles east of Australia, have many physical resemblances to the Neanderthal race of prehistoric man, according to reports received from Prof. Fritz Sarasin, a French anthropologist.

The New Caledonians are considered as among the lowest and most primitive of savages, a fact that gives additional point to Prof. Sarasin's findings. He states that in a few respects they seem to be even more primitive than the long-extinct Neanderthals, notably in their chinlessness and the simian structure of their noses. In other respects they are less primitive; but in general there is a singular and striking resemblance.

DECLINE IN DIABETES FORESEEN BY EXPERT

A decline in diabetes may be expected since the occurrence of this disease has now about reached its maximum, Dr. Elliot P. Joslin of Boston, one of the leading specialists in this disease, states in a report to the American Medical Association. Particularly is a decrease in case and death rates to be expected if proper preventative measures, involving use of insulin, proper diet or both are taken.

Dr. Joslin finds that the diabetic patient of today averages eleven years older than those seen ten years ago. Early fatal cases and groups of living patients in former years averaged 41 years of age, but a similar group now averages 52 years of age.

The chief predisposing cause of diabetes is fat. Diabetes has always been known to be more common among Jews than other persons, and this increased incidence, Doctor Joslin finds, is due to overweight. Eighty-five per cent. of Jewish patients were overweight in contrast to 70 per cent. of 1,000 non-Jewish patients. Doctor Joslin finds no congenital tendency to diabetes among the Jewish patients, but rather an increased incidence of diabetes when such patients become older and fat.

The experience thus far had with insulin confirms the impression that it is a great discovery, Dr. Joslin says. Diet alone is sufficient for a large proportion of the diabetic patients in advanced life, but insulin has been of great educational value in causing the public to give more attention to diet and to a study of the human body.

SAWDUST "VOLCANOES" BECOME SMOKE PESTS

Northwest coast cities have developed a "smoke nuisance" of a unique type, in the frequent fires caused by spontaneous combustion in the enormous heaps of sawdust accumulated on old sawmill sites.

Following a year's rest "Vesuvius", Leshi Beach's sawdust volcano, has become active and has driven residents of the district from their homes with its clouds of heavy smoke. City firemen subdued the smudge by a generous soaking of the crater. At Port Angeles a sawdust pile has simmered and smoked for twenty years, now and then bursting forth in flame and huge black clouds of smoke.

At Everett, a pile of mill refuse covering an area of ten acres is a source of constant menace because it has been burning within for years. To remove the eye-sore would require a vast amount of money and to burn it at once would be impracticable. The heap would burn and smolder for weeks making the city and nearby towns almost uninhabitable.

To remove such sawdust piles as are hindering the expansion of the industrial part of Seattle, the city council is now considering a plan whereby huge hydraulic machinery can be utilized to loosen and wash away the refuse into the Elliott Bay, an arm of Puget Sound.

To date no use has been found for the old sawdust, the new factories requiring this material demanding clean fresh refuse direct from the mills.

A spring balance in which the "spring" consists of a solid metal bar over an inch in diameter is used by the U. S. Bureau of Standards as an aid in calibrating testing machines.

BLOOD GETS REDDER AS MEN GO HIGHER

The reddest-blooded Americans probably are the folks who live on the crest of the Rockies, and there is more literal, physiological truth in the "blue-bloodedness" of the Atlantic shore-line than we have been accustomed to think. At least, this will be the case if the facts discovered by Dr. Joseph Barcroft of the physiological laboratory of Cambridge University, England, are as true here as they are over the water.

One of the things Doctor Barcroft found is that hemoglobin, the red pigment of the blood, increases in quantity as one ascends to higher altitudes. He tells of an English scientist, the hemoglobin content of whose blood was slightly below normal at sea level. He ascended to Cerro de Pasco in the Andes, 14,200 feet above sea level. Four days later it had increased more than two per cent. Fourteen days later it had gone up more than 18 per cent.

ELECTRIFIED SEEDS FAIL TO MAKE GOOD

Electro-chemical treatment of seeds to speed growth and increase yield apparently has been shown to be of no value by Department of Agriculture experiments. The process, which originated in England, consists in soaking the seeds in a conducting solution and then shooting through an electric current. Experimenters in Australia reported a 40 per cent. crop increase from wheat so treated. In England increases of from 20 to 30 per cent. were claimed.

At the Department's Arlington Experimental Farm the treated seed actually yielded 1.1 less bushels per acre than the untreated seed and no effect on plant growth or disease infection could be noted.

TABLOID BOOK REVIEW

POPULAR RESEARCH NARRATIVES: Published for the Engineering Foundation by Williams & Wilkins Company, Baltimore. Fifty cents postpaid.

These narratives are concise stories of modern research written from information supplied by those who actually did the work. The various chapters were originally issued in leaflet form by the Engineering Foundation, Alfred D. Flinn, director. Dr. Edwin E. Slosson, director of Science Service, has written the introduction to this volume of excursions into science, engineering, and discovery.

EVERYDAY BIOLOGY: By J. Arthur Thomson, New York: George H. Doran Co. \$1.25.

For traveling bag on vacation or for bookshelf at home this book is better than the best of the "best sellers" in fiction. The fault with the "Outline of Science" was that Professor Thomson could not write it all in person but this little volume is obviously from his own pen for there are few who can handle facts in such a charming and unpretentious style. Here the reader will find the latest discoveries about our bodies put in a way so he can easily understand it. Like all the volumes of "Doran's Modern Reader's Bookshelf" it is readable, reliable and up to date -- a difficult combination to get.
