SCIENCE NEWS

Science Service, Washington, D. C.

RECENT EARTHQUAKES

SIX heavy earthquakes in three days, five in the North Pacific Ocean, near the Aleutian Islands, and one in the Atlantic Ocean, near the Azores, not to mention many weaker shocks, have made the few days following the fourth of July a time of unusual restlessness for the earth. Fortunately, all of the tremors, though severe, have been far enough from well-settled regions to prevent great damage.

The Aleutian Island region has been particularly active. The first quake to be located there was on Friday, July 5, at 9:20 P. M., eastern standard time. Its center was found to be 51 degrees north latitude and 179 degrees west longitude. By means of data obtained from a number of seismograph stations by *Science Service*, the government seismologists located the centers of four other quakes at the same place.

These occurred at 5:36 P. M. and 9:04 P. M., eastern standard time, Friday, July 5; 6:10 P. M., Saturday, July 6, and 4:23 P. M., Sunday, July 7. Even though the Aleutian Islands are known to be a region of frequent earthquakes such activity as this is unusual.

The Atlantic Ocean earthquake came along at the same time as the activity in the Pacific, at 4:46 A. M., on July 6. Using the *Science Service* data, it was found that this was centered at approximately 41 degrees north latitude and 26 degrees west longitude, which is in the Atlantic Ocean just north of the Azores.

The various earthquakes were detected on seismograph instruments at Georgetown University, Washington; University of Virginia, Charlottesville; St. Louis University, St. Louis; Regis College, Denver; stations of the Coast and Geodetic Survey at Tucson, Arizona; Sitka, Alaska, and Honolulu, T. H.; the Dominion Observatory, Ottawa, Canada; the Meteorological Observatory, Victoria, B. C., and the Philippine Weather Bureau at Manila.

VITAMIN CONTENT OF DRIED FRUITS

DRIED fruits which have been treated with sulphur dioxide gas maintain their vitamin C content, and therefore their ability to prevent scurvy, according to a study to be reported in *The Journal of Biological Chemistry*, by Agnes Fay Morgan and Anna Field, of the University of California. The same fruits dried and not subjected to the sulphur dioxide treatment lose their vitamin value.

Fruits and vegetables are known to contain vitamin C, and it has been considered that these foods must be fresh when used to prevent scurvy. Since the danger of scurvy is greatest under circumstances where an adequate supply of fresh vegetables and fruits is most difficult to obtain, much interest has been shown in the effect of methods of preservation upon the vitamin C content of foods. Numerous studies have been made upon citrus fruit juices, cabbage, milk, potatoes and tomatoes.

Apparently the more acid foods, such as citrus fruits and tomatoes, are not only more richly endowed with vitamin C, but are also better able to resist destruction of this vitamin by drying or processing.

Because of the inconsistency in previously reported work by other experimenters, and because of the economic importance of the commonly used dried fruits, the experimenters used peaches as the basis for their work.

Fresh, completely ripe peaches were used. They were picked, pitted and ground in a food chopper. Some of the batch was sun-dried and some dried in dehydrators. Part of the dried batch was submitted to the action of sulphur dioxide over night. Then feeding experiments were made using guinea-pigs. It was found that the sulphured fruit retains the full vitamin C content of the fresh fruit, but the unsulphured dry fruit retained no detectable amount of this vitamin. The sulphured, dried peaches were found to rank with orange juice, raw tomatoes and other highly potent antiscorbutic foods.

DANGERS OF X-RAY THERAPY

X-RAY therapy, one of the blessings of modern science, can, in exceptional cases, produce feeblemindedness and deformity in human beings. This possibility has been discovered through investigations by Dr. Douglas P. Murphy, of the University of Pennsylvania, who emphasized that the danger is limited to treatments with X-rays, which does not include the taking of an ordinary X-ray picture.

Mothers shortly before the birth of their children are sometimes treated with X-ray irradiation for malignant growths. If the growing child is subjected to the irradiation from the X-ray machine at the same time that the therapeutic measures are undertaken, it has been determined that there is about one out of three chances that it will be feebleminded. Malformations of the head and dwarfing of the limbs may occur under such conditions. Dr. Murphy has studied over a hundred instances of X-ray treatments under such conditions and he found that serious results had followed in one third of the cases.

There is no danger in an ordinary X-ray picture if it is taken of the mother before the birth of her child. Neither has Dr. Murphy been able to discover any injurious effects upon subsequent children from X-ray treatments that were given before pregnancy. With knowledge of the danger involved, Dr. Murphy explained, X-ray specialists will be able to prevent the risk of unhappy consequences.

POSSIBLE BIOLOGICAL EFFECTS OF COSMIC RAYS

THE cosmic rays, that continually bombard the earth from outer space, may now be much less intense than they were in past ages, and that may be the cause of the present world-wide increase in cancer. This is the suggestion of a prominent Irish physicist, Dr. J. Joly, of Trinity College, Dublin, expressed in the British journal, *Nature*. Dr. Joly admits that his ideas are "certainly at present purely speculative."

"There seems to be no sure ground for believing that the penetrating radiations are uniformly distributed throughout space," said Dr. Joly. "If they are not, and if considerable variations in the strength of those reaching the earth have occurred in the past—possibly referable to translatory movements of the solar system—then serious effects upon organic evolution may have taken place. Millikan estimates their present energy as equal to about one tenth of that reaching the earth from the luminous radiation of the stars. At present, therefore, the penetrating rays are probably without positive effects upon organic life. It does not follow, however, that a recent decline in strength would be without serious effects."

Dr. Joly expressed the belief that the effect of such radiations such as penetrating rays and X-rays upon living tissue is due to the rays being absorbed and changed to beta rays, one of the three kinds of radiation emitted from radium. Medical researches, he said, show that such rays have a selective influence. The same rays that destroy diseased tissue may actually have a healthful and stimulating effect upon neighboring health tissues. Thus, X-rays are used in the treatment of cancer.

As there has been a marked increase in cancer throughout the world in recent times, Dr. Joly suggested that it might be due to recent reduction in the intensity of cosmic rays, which formerly destroyed the cancerous tissue nearly as fast as it was formed.

WOOD-ROT STUDIES

IRA HATFIELD is studying living wood-rot organisms at the Forest Products Laboratory, Madison, Wis., in an attempt to discover some weakness in their life habits which might enable mankind to exterminate them effectively in trees, timber or wooden structures.

Like children, decay organisms can not exist without water, food, warmth and air. Wood is the food element and water is the life element easiest to control. That is why Mr. Hatfield is singling out pure strains of the wood-decaying organisms and rearing them under conditions which are as superior to those surrounding the rich man's baby as the baby's environment is superior to that of an alley cat.

"If my observations can determine the least amount of water wood-rot can thrive on or the most water it will tolerate," Mr. Hatfield said, "we shall then be able to stop decay and rot in wood either by drying the wood until the wood-rot organisms die of thirst or by soaking the wood until the organisms drown."

The organisms at the laboratory must have as much air as they would have in any lumber yard and there must be absolute assurance that undesirable alien spores of other organisms are not gaining access to the wood on which the pure wood-rot organisms are growing.

In Mr. Hatfield's series of tests the temperature of the growing decay organisms is maintained by incubator. An elaborate ventilation system, which employs both chemical and mechanical means, relieves the air supply of carbon dioxide and excess moisture. A chemical solution detains all the undesirable decay spores which are universally present in the laboratory air as they are everywhere. By means of one chemical solution through which it passes the humidity of the air—and correspondingly the moisture in the wood—is controlled to a fraction of a per cent. The growth of the wood-rot organisms under the artificially controlled moisture conditions is measured, not by crude physical methods, but by measuring the amount of carbon dioxide given off, just as the work done by an athlete on a physician's treadmill is measured by the amount of carbon dioxide he exhales.

"The battle with decay in wood, whether it be waged with wood preservatives or by sanitary control measures, is a contest for a rich prize," Mr. Hatfield said, "for more than four billion cubic feet of lumber and wooden products are destroyed by decay every year in the United States. The magnitude of this loss is comparable only with the loss from forest fires."

BETA LACTOSE

A FORM of milk-sugar, called beta lactose, sufficiently sweet to be used as a table sugar, is about to be produced commercially at Battle Creek, Mich., through the efforts of Dr. John Harvey Kellogg, director of the Battle Creek Sanitarium.

The usual form of lactose is a chalk-like, slightly sweet powder that is difficult to consume in quantity. Since milk-sugar is sometimes used therapeutically as a substitute for ordinary table sugar, chemically known as sucrose, the production of a form of lactose three times as sweet and three times as soluble as commercial lactose is likely to prove of value to medical practice. Patients will be able to substitute the beta lactose for the common sucrose of the table and this milk-sugar will be taken as a food rather than as an unpalatable medicine. It is about a third as sweet as ordinary sugar and will cost about fifteen to twenty times as much per pound.

Some physicians believe that lactose is preferable to the ordinary sucrose, produced from sugar-cane or sugar-beets, as a source of sweet carbohydrates in the diet. It is more slowly absorbed in the system than other sugars and it is claimed to promote the growth of more beneficial bacteria in the lower portion of the alimentary canal. Lactose is formed nowhere else in nature than in the milk of mammals, not even in their blood. The fact that the bodily processes take the trouble to make this special sugar for the mother's milk caused scientists to discover that lactose seems to play an important part in keeping babies free from such diseases as typhoid, dysentery and cholera. Predatory microbes can not thrive in the infant's food tract because they can not live in the lactic or buttermilk acid that the fermentation of lactose produces. A special sort of bacteria, *Bacillus bifidus*, populates the lower food canal of nursing babies and these bacteria are the helpful agents that transform the lactose into the protecting lactic acid.

The theory back of the suggested substitution of lactose for sucrose as a special dietary measure is that such a protective bacterial action would be created in the lower food tract of the adult by the liberal use of the milk-sugar.

It has been known for seventy-five years that lactose exists in two forms having the same chemical composition, twelve atoms of carbon, twenty-two atoms of hydrogen and eleven atoms of oxygen to the molecule, but differing in physical properties. A quarter of a century ago, Dr. C. S. Hudson, the American sugar chemist formerly at the U. S. Bureau of Standards and now at the U. S. Hygienic Laboratory, clearly described the making of the sweeter beta form of lactose. From a solution of alpha lactose or milk-sugar of commerce, the beta sugar can be crystallized out at a temperature about 200 degrees Fahrenheit.

Nearly two fifths of the total solid content in cow's milk consists of lactose and it is estimated that over a third as much lactose as cane-sugar is consumed annually when the lactose content of milk is considered. Dr. Amé Pictet, the Swiss sugar chemist, recently announced that he had succeeded in synthesizing lactose, but the possibility of producing milk-sugar in this way or any other way than from milk, is quite remote.

ICE CREAM FOR RICKETS

ICE CREAM may be used as a cure for rickets and may even be substituted for cod-liver oil in treating or preventing that disease of childhood. Since the discovery by Dr. Steenbock, of the University of Wisconsin, of the process for rendering certain foods valuable in prevention and treatment of rickets by exposing these foods to the effect of rays from an ultra-violet lamp, many experiments have been conducted using dairy products. Milk and milk products have been subjected to this process. In the experiment conducted at Rutgers College ice cream was exposed to ultra-violet rays with favorable results.

The dairy products for the ice cream mixes were from cows which were in the barn most of the time and were obtained at a time of the year when the ultra-violet intensity of the sun's rays was low. The ice cream mixes were made according to commercial processes and were then submitted to light from a quartz-mercury vapor lamp at a distance of 12 inches for two- and ten-minute periods. It was found that the ice cream exposed to the lamp's rays for ten minutes acquired a fishy flavor which was attributed to absorption of some of the ozone generated by the lamp. The flavor of the ice cream which was exposed for only two minutes was not objectionable.

Two groups of rats in which rickets had been induced were used. One group was fed on the irradiated ice cream and the other on ice cream from the same mix which had not been exposed to the lamp. It was found that the irradiated ice cream healed rickets, whereas the non-irradiated ice cream did not produce any healing effect.

Further tests demonstrated that freezing and low storage temperature do not affect the antirachitic value of the irradiated ice cream for at least two months.

ITEMS

ACCORDING to Professor E. L. Moseley, of the Ohio State Normal College, the American quail, or bob-white, has a decided taste for the striped pests of potato-fields, and where it is given a chance will clean them out completely. Professor Moseley's observations have been supplemented by those of many other persons he has questioned. He finds that where bob-whites are protected by a closed season and increase greatly in numbers, as they have in Ohio, potato beetles diminished to a point where it is no longer necessary to spray the vines with arsenicals. Where the birds lack good nesting shelter, or where they are disturbed, as by the close neighborhood of a highway, they do their work less thoroughly and the beetles are apt to re-invade the fields.

WHEN a museum accumulates more pictures or rock specimens or other objects than it can possibly exhibit or use for study, it should weed out the surplus. This was the advice given by Robert W. DeForest, president of the Metropolitan Museum of Art, in an address before the American Association of Museums at its annual meeting. Larger museums have passed their initial stages of getting together a collection, he pointed out. Many museums have reached the limit of exhibition space. Others have exhausted available storage facilities. And still there are constant gifts and accessions. Disposing of articles is a procedure which may have far-reaching consequences, in its effect on donors and prospective donors, and on friends of the museum in general. Mr. DeForest took the stand that weeding out needless duplication is a duty to the public which a successful museum must discharge to the best of its ability.

LARGE-SIZED type is read more slowly by adults than is type of a medium size, according to Professor Donald G. Patterson and Miles A. Tinker as a result of a test given by them to 320 sophomores at the University of Minnesota. The test material consisted of paragraphs of equal reading difficulty printed in 6 point, 8 point, 10 point, 12 point and 14 point type. All the lines were of equal length, 80 millimeters, a little over 3 inches. The students' speed of reading was determined for each different size of type and it was found that the material in 10 point type was read more quickly than either the smaller or the larger type. The number of words read per minute from 10 point was 6.2 per cent. greater than from 6 point, 5.2 per cent. greater than from 8 point, 5.8 per cent. greater than from 12 point and 6.9 per cent. greater than from the 14 point. The 10 point type is the size commonly used in well-printed books.

ACID soil has long been decried as bad farm land for so many years that it has come to be considered by current thought as no good for anything. It may, however, be as good for growing crops of wood as it is bad for growing crops of grain, according to results of experiments recently performed by Henry I. Baldwin, of Berlin, N. H. Mr. Baldwin sprouted red spruce seeds in water of varying acidity and alkalinity. He found that slightly acid water was better than any of the alkaline waters. He got the best results in pure distilled water, which is perfectly neutral; but of course distilled water is never found under natural conditions.