SCIENCE NEWS

EARTHQUAKES AND ENGINEERING CONSTRUCTION

Science Service

AN investigation of the Japanese earthquake with special reference to its effect upon buildings and engineering construction of all sorts is about to be undertaken by the American Society of Civil Engineers. Data bearing on the subject will be collected and compared with similar data collected after similar disasters in the past, with the view to putting them all on record permanently so that they may be accessible to every one concerned in the design and erection of structures of all kinds.

Colonel John Millis, U. S. Army, Corps of Engineers, retired, a member of the special earthquake committee, has explained to Science Service: "It has been demonstrated in a most disastrous way that with all the investigation that has been given to the subject of earthquakes, man has not been able to devise constructions for housing and other indispensable human requirements of the civilized world which will withstand these disturbances. It is beyond human power to avert earthquakes and very little progress has so far been made in the matter of prediction of their occurrence. Even if this could be done with measurable success there remains the problem of designing and building structures in such a way as to withstand as far as possible an experience which is practically certain to occur in many localities and which may break out in the most unexpected places."

"This latter was illustrated," Colonel Millis said, "by the Charleston earthquake, and by the severe shocks which occurred over the middle Mississippi valley more than 100 years ago. This earthquake would inevitably have caused great destruction had there been structures in the locality susceptible to destruction by such disturbances of the earth's crust."

Colonel Millis, of Cleveland, Ohio, is the eastern member of the special earthquake committee and other members, including the chairman, will be selected from Pacific Coast members of the American Society of Civil Engineers. Persons who may be able to contribute information bearing upon this subject, which is literally of world-wide interest, are urged to communicate all available data to John H. Dunlap, secretary, American Society of Civil Engineers, 33 West 39th St., New York, N. Y.

RADIO BEACONS

Science Service

RADIO beacons, used in connection with direction finders on ships for the purpose of ascertaining position at sea in thick weather, are given the highest praise by Commodore Sir Bertram Hayes and other navigating officers of the White Star liner *Majestic*, one of the largest vessels afloat, according to a report of the U. S. Lighthouse Service. Radio beacons are operated on an entirely different principle from radio compass stations such as the one at Pt. Arguello, California, which has recently figured prominently in the inquiry concerning the wreck of seven U. S. destroyers near that point. In the radio compass station, the position of the ship is worked out on shore; in the radio beacon system, by the operator on shipboard.

Officers of the *Majestic* report that on a recent voyage from New York to Boston and return, the vessel was in fog nearly the whole time and was navigated almost wholly by radio bearings taken from the ship. Nantucket lightship was made so closely that the *Majestic* passed between it and the marking buoy.

On a recent voyage to Europe the big liner, which was in fog four days before reaching Cherbourg, was navigated by radio bearings on approaching the French coast, and made the entrance to Cherbourg harbor exactly. The radio direction finder is also used on the *Majestic* for locating other vessels in fog. The direction-finding work on the ship is given preference over all other radio work.

Direction finders for use in connection with radio beacons are being installed on a number of vessels of the Cunard line which has not heretofore used this instrument. A new radio beacon station is being installed at Cape Ray on the Newfoundland coast.

THE AMERICAN CHESTNUT CROP

Science Service

EFFORTS to save the chestnut industry of this country, which is rapidly being swept out of existence by the chestnut blight, were described to the Northern Nut Growers Association in fourteenth annual convention at Washington by C. A. Reed, of the U. S. Department of Agriculture. He told of failures, disappointments and promising successes in securing trees resistant to this damaging plant disease.

The chestnut blight is the result of a fungus growth which gets under the bark of chestnut trees and destroys the trees by girdling them. It was discovered in 1904 in trees on Long Island which had been brought in from Asia. Since that time, it has spread throughout the chestnut growing regions of the eastern United States, made gaunt white skeletons of what were once valuable food and timber trees, and threatens to completely wipe out the American sweet chestnut.

Among the once-promising experiments which have proved a disappointment, according to Mr. Reed, is the cross of the native small sweet chinkapin with the large Japanese chestnut which is almost without flavor. Seedlings from this cross developed nuts in eighteen months and during their early days appeared to be resistant to the blight. Later the blight also attacked them.

The most promising variety now appears to be the Chinese chestnut. The chestnut blight originated in China and the trees which have survived there are those not subject to it. Although the American sweet chestnut is the best chestnut known, the Chinese chestnut is also of good size and quality, and experiments indicate that it

may become of commercial importance in this country and may replace the less resistant kinds. The Chinese trees, however, are small and not so well suited for poles or other lumber purposes as are the native trees now being killed by the blight.

There are regions in California, Oregon, Michigan and other parts of the country in which few chestnut trees are now raised, but which are well adapted to them, and there is hope that the chestnut can be established on a commercial scale in such regions free from the blight.

PRE-HISTORIC STUDIES IN EUROPE

Science Service

APES seemingly more closely related to man than any species now in existence lived in Europe more than a million years ago, Dr. Aleš Hrdlička, curator of physical anthropology of the U. S. Smithsonian Institution, said on his return from Europe, where for several months past he has directed the work of the American School for Prehistoric Studies in Europe.

The school visited all the important sites where remains of early man have been found and the students saw practically all the valuable original fossils of ancient men and fossil European apes.

"The thing that impresses most is the vastness of the deposits containing early man's remains in western and central Europe, and the little that is now being done in many places in the way of systematic investigation of them.

"European countries are in general too impoverished to carry on the work and what interest is being shown is mostly by individuals and directed to the cultural rather than the natural history of man.

"The large fossil apes which lived in Europe from one to three million years ago are even less known than ancient man, yet the study of these forms is of great importance. Observation and careful measurements have shown in at least one case, that of the *Dryopithecus rhenanus,* that these fossil apes were more closely related to human beings than most if not all of the other known species of apes. Further search for the remains of these forms is of the greatest importance, for they may connect with some of man's precursors, if not with his own ancestry."

Dr. Hrdlička stated that these fields of investigation present a great opportunity to American scientists. Sites which are known to contain remains of early man are readily available for exploration and American participation in the work would prove a leaven which would stimulate and rejuvenate work everywhere, besides being sure of results of great value to science and to human knowledge in general.

"As to the previous specimens that have already been discovered and which may be counted already by the scores, it is absolutely essential that they be studied in the original." Observations on imperfect casts have already led to serious errors. In some cases scientists working with casts have arrived at wrong conclusions because essential features of the skull or the jaw were either perverted or not brought out in the cast. In one instance, Dr. Hrdlička said, not only he, but even the representative of the institution in which both the originals and the casts were present, had trouble in matching the casts and pictures with the originals because they were so unlike. Measurements of the teeth and other fossil remains in particular, he said, require such accuracy that a mistake of a very small fraction of an inch may mean throwing the specimen out of its own into another class.

Among the periods of the Ice Ages, about which least is known of the development of man, Dr. Hrdlička mentioned the second interglacial period when for thousands of years the glaciers melted, warm climate prevailed in Europe, and lions, camels, ancient elephants, rhinoceroses and other tropical creatures roamed over that part of the world. Worked pointed stones used as weapons and implements by the early men of this period are plentiful, but fossil bones of man, except for one jaw-bone found in Heidelberg, Germany, have not as yet been unearthed. Yet they are there somewhere, as are even earlier traces of man, and are waiting to be unearthed by systematic work on a larger scale than is now practiced in Europe.

BEAVERS AND FOREST FIRES

London Times

THE Roosevelt Wild Life Forest Experiment Station of the New York State College of Forestry, Syracuse University, has issued a report on the beaver in the northern section of Hamilton and Herkimer counties in the Adirondacks. The report is based on an investigation by Dr. Charles E. Johnson, fur naturalist connected with the Roosevelt Station.

Dr. Johnson makes some interesting statements regarding the relationship of beaver operations and forest fires. Two opposite opinions on this subject are dealt with in the report. It is said by some that the dead timber in beaver flows constitutes a potential fire menace. That as the beaver dams in time will be abandoned and gradually disintegrate the receding water will leave exposed masses of dry timber, in which forest fires might originate and travel rapidly. Dr. Johnson shows, however, that where beaver are present in large numbers that new families reoccupy dams about as fast as they are abandoned and that the period of fire risk would be relatively short.

On the other hand, it is pointed out that beaver flows constitute effective fire breaks. Streams a few inches or a few feet wide are frequently transformed by the beaver into a series of ponds or flows, rods in width and hundreds of yards in length, and in heavily forested parts or in open cut-over or burned areas the barrier formed by such flows may prove of considerable value in a fire protection system. Flows are considered a disadvantage by some when it comes to fighting fires, as they are thought to make it impossible to maintain good passable trails, therefore rendering communication difficult and thus outweighing any advantage they might have in forming a barrier to the progress of forest fires.

Dr. Johnson's report contains much information on the habits and numbers of beavers, their operations and effect upon forest conditions of the Adirondacks. The bulletin will be mailed free to any applicant.

PRESERVATIVES IN FOOD

London Times

A DEPARTMENTAL committee of the Ministry of Health is at present inquiring into the use of preservatives and coloring matters in food and is to report whether the use of such materials or any of them is injurious to health and, if so, in what quantities their use becomes injurious. Many physiologists have come to look on food preservatives with suspicion. Nothing, it is admitted, has been proved, but there is a feeling that the something wrong may well be connected with the change in the character of the food supplies of the country. The question has many difficulties. America has tried to deal with the situation by legislation and regulations establishing standards of composition for innumerable articles, but these, it is contended, have not solved the problem.

Public authorities in this country have not as a general rule concerned themselves greatly where the character or percentage of a preservative in food is unlikely to prove immediately dangerous, but the reports of medical officers are strewn with revelations of food poisons. Sir George Newman, in his report for 1922 as Chief Medical Officer of the Ministry of Health, states that during the year a considerable number of samples were examined in the ministry's chemical laboratory. Among them were liquid eggs and sponge cakes for boric acid, imported caviare preserved with formaldehyde, indelible ink for marking carcasses, cereal products, cocoa, tea and baking powders examined for arsenic, cheese—from a food-poisoning outbreak at Dover—examined for metallic poisons and stewed apples contaminated with zinc from cooking vessels. A large amount of work, Sir George Newman states, has been done in perfecting the electrolytic method of estimating arsenic. An apparatus has been evolved which constitutes a great improvement on previous types, and is likely to be adopted in other laboratories.

The presence of arsenic in food materials can in most cases be traced to the use of ingredients in the preparation of which arsenical sulphuric acid has been used or which have been dried in contact with the fumes from arsenical fuel. The report records among other cases of food poisoning an outbreak in July, last year, due to lead in beer caused by conveyance in tank wagons to public houses where it was placed in lead-glazed tanks. In Manchester samples from soda fountains revealed the presence of lead, copper and zinc in dangerous quantities due to the erosion of tin in a tin-lined copper cylinder. Sir George Newman adds that "under modern conditions the feeding of the people of these islands, a large proportion of whom are town-dwellers, with foodstuffs derived in greater or less degree from abroad is a complex problem. Of necessity, canned and prepared foods now enter largely into the dietary of the British public and form an important and valuable part of the food supply of the nation. That illness of one sort or another should occasionally result from their use, as it does from other forms of food, is well-nigh inevitable. Having regard, however, to the enormous quantities of canned and prepared foods consumed, the remarkable fact is not that accidents should occasionally occur from their use, but that these accidents should have been so few and far between."

ITEMS

Science Service

THRESHING machines, in addition to the seed and wind, are important in spreading the spores of flag smut through wheat fields in several counties of Illinois and Missouri, in the opinion of R. D. Rands, who has investigated the disease for the U. S. Department of Agriculture. "That thrashing machines are a common carrier of this smut from farm to farm, just as it is known to distribute bunt spores, wild onions, cockle and volunteer rye, is probable if we may judge from our success in locating advance infections by following threshing runs. For example, we have frequently found flag smut on farms surrounded by apparently disease-free ones, located long distances from the nearest known infection where the farmer had for many years used his own wheat for seed, but usually where an infected crop had been threshed before his in another part of the same run. While it is of course possible that the smut was carried to such farms by wind or other agents, it seems more likely that the threshing machine or bundle wagon was responsible."

AFTER smoking a cigar or three cigarettes, blood pressure rises and the heart beats faster. This is the finding of Dr. Robert L. Bates, psychologist at Johns Hopkins University, who carried on experiments so that physicians could have real evidence on the dangers of smoking during sickness. The rise in blood pressure and heart rate is only as much as might occur normally due to other conditions and both return to normal in from twenty to thirty minutes. Dr. Bates was unable to determine how much of the change was due to the products of smoking tobacco and how much to mental effects, for it is known that emotions and mental processes may also affect pressure and heart rate.

CITY planners should cooperate with the Weather Bureau and learn how to let the wind blow the smoke out into the country rather than over the residence districts, says C. J. Root, meteorologist of the local office of the Weather Bureau, who has acted as adviser to the commission in Springfield, Ill., which is making a comprehensive city plan for future development. An examination of records there showed the prevailing wind to be from the south in all months except January and February, and the industrial district is accordingly to be localized in the northeast section of the city. Where natural features such as lakes and rivers prevent the growth of a city in a given direction or the establishment of an industrial zone to leeward of the business and residential, some modification is necessary, Mr. Root says, although in all cases an intelligent use of Weather Bureau records may save millions of dollars damage from smoke and soot.

AN important railroad in the Belgian Congo in Central Africa is soon to be electrified and power formerly wasted from rapids and waterfalls will be made to replace expensive coal brought from Europe.