SCIENCE NEWS

BIOLOGICAL STATION OF THE INSTITUTION FOR RESEARCH IN TROPICAL AMERICA

Science Service

CONSTRUCTION of a biological station on the wild, virgin jungle of Barro Colorado Island, in Gatun Lake just off the steamship channel of the Panama Canal, has been begun by the Institution for Research in Tropical America, in which over twenty of the leading museums, societies and universities of the United States are cooperating, according to the report of Dr. A. S. Hitchcock, chairman of the executive committee of the organization, announced at the Smithsonian Institution.

The island was created by the formation of Gatun Lake in the building of the Panama Canal. It was one of the high spots in the tropical jungle which was submerged to make the lake, and contains over 3,000 acres. As the waters arose in the lake, the forest animals took refuge on it in unusual numbers. Many jaguars, tapirs and other large animals are known to exist on Barro Colorado, which is also an insect paradise and rich in plant material.

Last June the government set the island aside as a reservation for biological research. No hunting, tree cutting or settlement is allowed on it. It has been given to the custody of the Institution for Research in Tropical America and a laboratory is being erected where biologists, entomologists, zoologists and botanists may find shelter for their apparatus and a place to set up their cots. James Zetek, of the U. S. Department of Agriculture, is serving as the local custodian of the station.

Barro Colorado is only a mile and a half from Frijoles Station, on the Panama Railway, ten miles from Gatun and ten miles from Gamboa. But, although easy of access, the scientists working at the laboratory will literally have the wild at their door. Within a few feet of the station now under construction there is abundance of unstudied plants, animals and insects. The building will be screened and protected against the wood-eating ants which abound in the tropics.

Not only has this government recognized the importance of Panama as a field for biological study, Dr. Hitchcock said, but the Republic of Panama also recently set aside a beautiful site for a Marine Biological Station on the bay front in the modern section of the City of Panama, next to the site of the Gorgas Memorial.

The Institution for Research in Tropical America operating the Barro Colorado site was initiated by the National Research Council and is an association including representatives of the American Anthropological Association, American Museum of Natural History, American Phytopathological Society, American Society of Agronomy, Brooklyn Botanical Garden, California Academy of Sciences, Carnegie Museum, Commercial Museum of Philadelphia, Ecological Society of America, Harvard University, Indiana University, Johns Hopkins University, National Geographic Society, New York Academy of Sciences, New York Zoological Society, University of Michigan, Philadelphia Academy of Sciences, Smithsonian Institution, Yale University, University of Florida, American Genetic Association and the National Research Council.

RADIO

Science Service

A NEW, directive type of radio beacon which will be of great use to navigators of the air or water has been perfected by the U. S. Bureau of Standards in cooperation with the Signal Corps and Air Service of the Army. It will make direction finders on shipboard less necessary.

The beacon consists of two coil antennae so placed as to cross each other at an angle of 135 degrees. The transmitting set is automatically connected first to one and then to the other, one letter of the signal being sent over each. The intensity of the signal from an antenna of this type varies from a maximum in the plane of the coil to almost zero at right angles. A receiving set placed along the line bisecting the angle between the coils will therefore receive signals of equal intensity from both.

A ship or airplane receiving the signals will be able, by first proceeding to the point where the two signals are of equal intensity, to steer directly for or away from the beacon without regard to conditions of visibility. The signals may be received by the most ordinary receiving set and may thus be of value to motor boats and small craft generally.

The invention will be of great value in aviation. Its efficiency was recently proved when an airplane flew from Dayton to a point 100 miles away, with the pilot depending for guidance entirely upon signals received from one of these beacons by means of an ordinary airplane receiving set.

It will also be used in the navigation of rivers and crooked channels to supplement the range lights now employed. Beacons can be placed at the range light locations and navigators will be able to follow a straight course on the foggiest nights. It has already been tested successfully along the Potomac River and Chesapeake Bay by the Lighthouse Service, and may be used on the Mississippi River. Lighthouse stations along the coasts may be equipped with the new device, but it can not be used on lightships since they are continually shifting their directions with wind and tide.

Rules for the regulation of radio throughout the Western Hemisphere will be considered and formulated at the coming Inter-American Electrical Communications Conference which is scheduled to meet in Mexico City, March 27. The United States will be represented by two official delegates to be selected by the State Department, who will be accompanied by a number of technical advisers. All Latin-American countries, and Canada, are expected to send delegates.

The conference was proposed at the meeting of the Pan American Congress at Santiago, Chile, last year; and

the place of meeting was decided at a meeting of Latin-American representatives at the Pan American Union in Washington. All forms of electrical communications will be discussed but radio will be the principal topic, the general purpose of the conference being to bring up to date the regulations adopted at the London radio conference in 1912 and to amend them to fit conditions in the Western Hemisphere.

An international conference for the drawing up of radio regulations for the entire world has been proposed to the Advisory Committee on Communications and Transit of the League of Nations with the request that the council of the league take the necessary preliminary steps. The proposal was made by a committee of radio experts which recently met in Geneva. No official recognition of the proposal has yet been made by the United States.

PIONEER INVENTIONS OF THE CHINESE

Science Service

CHINA produced fundamental discoveries and inventions of greatest value to the human race long before the rise of western civilization, according to a statement made by Chung-Yu Wang, consulting mining engineer of Hankow, China, to the Engineering Foundation of New York. Mr. Wang points out, however, that "Unfortunately for China, and indirectly for the world, the Chinese mind, through centuries of classical education, has failed to make application of its new ideas and to make any progress from the inventions and discoveries of the ancients." The Chinese invented the compass, paper, printing, glass, the seismograph and many alloys, and, in addition, anticipated modern medicine.

Records show that Chow Kung in the Chow Dynasty, about 1122 B. C., used a kind of wagon equipped with an instrument that pointed always toward the north. Paper was first made by Tsai Lun, out of tree fibers, rags and hemp, during the Dynasty of Eastern Han, the early part of the first century. Fung To originated the art of stereotyped wooden plates about the year 932 A. D., but later investigation made by the sinologue Stanislas Julien has shown that the invention actually dated from the year 593. Glass was first manufactured by Pun Fang about the early part of the second century, and he had a piece carved with 130 designs. An instrument, resembling perhaps the present day seismograph, was invented by Chang Heng in the first century, during the Han dynasty, which could record any slight earthquake not perceptible by human senses.

In Tai Hao's time (2852–2737 B. C.) metallic coin was already in circulation. The inventive genius of the ancient Chinese can nowhere be more explicitly shown than in the art of making alloys. An alloy, similar to German silver, under the name of Pait' ong, was obtained by fusing "red steel" with arsenic. The manufacture by the ancient Chinese of gongs and tom toms, with their perfect tones, still remains to us a mystery, although their chemical composition has been determined. Mr. Wang also believes that there is a great deal of Chinese medicine that is both useful and illuminating when viewed in the light of occidental medical science. The Chinese anesthetic, known as Ma Fat powder, a sort of hashish, was discovered by the famous Chinese surgeon, Hwa To who lived in the early part of the second century during the Eastern Han dynasty. An old Chinese text tells us that Hwa To administered the medicine to his patients to render them unconscious before being operated upon. This happened long before ether or chloroform was discovered in Europe.

Recently two experimenters at the Rockefeller Institute for Medical Research, in New York City, obtained a white secretion, which they have named Bufin, by stimulating the parotid gland of the toad by means of electricity. Its physiological action is almost similar to that of digitalis. This is merely a rediscovery of a medicine long known in China. The identical white secretion is obtained by the Chinese by touching the biggest wart-like swelling just behind the eye of a toad with a hot iron. The secretions thus obtained from many toads are allowed to evaporate slowly to a powder, which is now mainly used as a heart remedy.

ARTIFICIAL MANURE

Science Service

ARTIFICIAL "farmyard" manure made without the use of animals is the achievement of English scientists at the Rothamsted Experimental Station. Chemical methods have been worked out whereby various plant products can be converted into a manure quite comparable with farmyard manure, and the process is being applied with success on a commercial scale in various parts of the world. The new fertilizer is expected to aid the tractor in its conquest of the farm.

Plodding scientific research led up to the invention. From 1913 to 1915, E. Hannaford Richards, a sewage chemist, investigated the losses which take place in the preparation and storage of farmyard manure. They were found to be very great. Mr. Richards considered the avoidance of part of these losses, which his work showed to be possible, as merely making the best of a bad job. To use his own words: "From the very start I set myself the problem of devising a method for preparing from plant products, such as straw, a substitute for farmyard manure which should be more economical than making the real farmyard manure by the recognized method."

His training as a sewage chemist enabled him to recognize the great similarity between the changes which take place in the manure heap, on the one hand, and in sewage purification on the other. Pooling information with a scientist who had been working independently on the utilization of organic materials in the soil, the invention was made.

In the manure heap there is always loss of nitrogen, chiefly as ammonia, but also in other forms, before it is put on the land; if straw itself be used as a manure it has a depressing effect on the yield. The highness of the ratio of nitrogen to carbonaceous matter is tied up with the loss of nitrogen in the first case, and the lowness of this ratio is the cause of the decreased yield in the second case. The essence of the new artificial method is to ad-

just this ratio so that there is neither loss of nitrogen in the rotting, nor excess of decomposable carbonaceous matter in the finished product.

This ratio varies for different waste products; as a result it is necessary to do an assay on any new material before it can be decided first whether it be suitable for the process, and, if so, secondly, what chemical activator shall be added to cause the material to rot satisfactorily. Even when the process was shown to have economic possibilities there were still great difficulties in placing it on a large scale. Viscount Elveden, who had always been interested in agricultural research, and whose ambition it had been "to see whether it is not possible to make certain branches of scientific research self-supporting," provided the capital necessary for commercial development.

Commercial tests to date show that straw, bark, banana leaves, bracken, rubber residues, rushes and Nile sud can be made into useful manure. Certain of these have been converted into manure on a large scale at a satisfactory cost.

COLOR GRADES FOR HONEY

Science Service

THE most extensive study of colors of honeys ever undertaken has just been completed at the Bee Culture Laboratory of the U. S. Department of Agriculture, says Dr. E. F. Phillips, in charge of the work. This investigation is expected to result in the standardization of the grading of honey according to color and to eliminate much confusion in the honey trade.

Commercial graders now on the market differ widely in the number of grades and the color shades used to indicate the differences. In the work just finished, the scientists secured the most complete collection of American honeys ever made, including samples from every state in the Union and several foreign countries representing 450 gradations from clearest water-white to the darkest amber. From this collection they have worked out eight standard color shades with which any given sample of honey can be compared to determine its proper grade.

As honeys change in color with time, the honeys themselves could not be used in a series of bottles which will serve as containers for the grade colors. It was necessary to devise chemical materials corresponding in color and opacity with the fresh honeys.

To do this, light transmitted through the various honey samples was measured by the spectro-photometer. This instrument breaks up the transmitted light into its various color waves by means of a prism. Substances were then prepared synthetically which would have fast colors which would transmit light with wave lengths corresponding to the wave lengths transmitted by the different grades of honey.

The government will place its findings at the disposal of all the manufacturers with directions telling how to make the standard graders. In the collections of honey made for this study, the lighter grades came mostly from the north and the darker grades from southern and tropical regions. This is believed to be due to the fact that the southern bees gather their raw material mostly from trees and the northern bees from smaller plants.

TAGGED SALMON

Science Service

FISH No. 10,358, one of the 10,000 salmon caught, tagged, and released by the United States Bureau of Fisheries south of Alaska last season, has turned up in a Siberian stream 2,000 miles across the ocean. He made the trip to get to his wedding at the old home stream where he began life as an egg.

This remarkable tale of Fish No. 10,358 is not a mere fisherman's yarn but is backed up by scientific records on two continents. According to the files of the Bureau of Fisheries, No. 10,358 belonged to the Oncorhynchus keta or dog salmon family. The identification tag stamped with this number was clamped on his tail last Fourth of July off the north shore of Unga Island, Alaska.

Released to go his own way, No. 10,358 evidently lost little time heading for home. According to word recently received from the Far Eastern Bureau of Fisheries, the fish wearing the tag marked "U. S. B. F. No. 10,358" was caught on August 18 in the river Pankara in the district of Karagin on the eastern shores of the peninsula of Kamchatka. The local residents did not pay any attention to this mark and the fish was cleaned and salted. Agents of the Far Eastern Fisheries Board at Vladivostok discovered No. 10,358 in the preserved state.

Examination showed that the fish was a male and had grown teeth. As salmon return to spawn in the same stream in which they were hatched from the egg, it was plain that No. 10,358 was a native of Kamchatka. Other tagged fish of the dog-salmon family have been retaken in Alaskan streams to the east of the feeding ground where they were tagged.

ITEMS

Science Service

MANY new species of orchids and ferns are included in the 4,500 botanical specimens just brought back from Central America by Dr. William R. Maxon, of the Smithsonian Institution. The rain-forests on the slopes of volcanoes in the interior mountain region of Costa Rica have a remarkably rich flora which will furnish an almost inexhaustible supply of plant material for scientific study for years to come.

THE red man's fondness for gaudy color schemes has long been known, but it has remained for Dr. T. R. Garth, of the University of Denver, to ascertain scientifically the color preferences of the Indians in the southwest. Full-blood Indians were found to prefer red to all other colors, then blue, violet, yellow and white in the listed order. White men, living in the same social and educational environment, preferred blue, then green and then red. The education of the red man has little apparent influence upon his favorite colors. The squaws and the braves agreed more closely in their select colors than the whites and the Indians did. The full-blood Indians were found to be very emphatic in their color preferences, much more so than the mixed bloods and the whites.