SCIENCE NEWS

THE TROPICAL PLANT RESEARCH FOUNDATION

Science Service

RECOGNITION of the large and increasing importance of the part played in the economic life of the temperate zones by the products of the plants of the tropics is seen in the incorporation of the Tropical Plant Research Foundation by some of the leaders in the United States in the knowledge of tropical plants. The foundation was initiated during the past year by a committee of the National Research Council and was incorporated June 6 in the District of Columbia.

The particular objects of the foundation will be to promote the study of the plants and crops of the tropics, to conduct investigations and to publish the results of them, and to establish and maintain such temporary or permanent stations and laboratories in tropical countries as may be necessary for the accomplishment of these objects.

The necessity for this study is stated by the organizers of the foundation to be the economic dependence of the temperate zones upon the tropics, from which come many of the necessities of modern life. This dependence will increase in the future. The quantities of sugar and oils, fiber and rubber, coffee and cacao, fruits and vegetables that are imported annually are only the vanguard of the future supplies that will be drawn from the tropics. The production, preparation and shipment of these products involve problems that have as yet received little study. With the exception of the areas under the immediate jurisdiction of the United States, the tropical agriculture of the western hemisphere does not have the counterpart of the governmental and institutional agencies which contribute so much to crop production within the United States.

The industrial importance of the scheme is recognized in the board of trustees, four of whom will represent industry. The other five will be scientists, chosen from several national societies more closely identified with the projected work. The initial board consists of George P. Ahern, former chief forester of the Philippines; J. T. Crawley, former director of Cuban and Porto Rican experiment stations; V. M. Cutter, of the United Fruit Company; Dr. William Crocker, director of the Thompson Institute; Dr. R. A. Harper, National Research Council; Dr. L. R. Jones, head of the department of plant pathology at the University of Wisconsin; H. C. Larkin, president of the Cuba Railway Company; Dr. S. C. Prescott, of the Massachusetts Institute of Technology, and Dr. D. L. Van Dine, of the American Society of Economic Entomologists. The scientific director and general manager will be Dr. W. A. Orton, now with the Bureau of Plant Industry of the U. S. Department of Agriculture.

Dr. Jones will be the first president of the foundation, and Dr. Harper will be vice-president. The administrative headquarters will be in Washington. Much of the laboratory work will be done at the Thompson Institute, Yonkers, N. Y., and field laboratories will be established in the tropics as needed.

GRADUATED AMPLIFIERS AS AN AID TO HEARING

Science Service

THREE-STAGE amplifiers, with means for delivering voice currents of several different volumes, is the latest method of helping the partially deaf to hear. Prediction of the eventual equipment of all places of public assembly with such devices was made by Dr. Harvey Fletcher in an address recently to a convention of the American Federation of Associations for the Hard of Hearing. Many of his audience were using such a system.

Loudness alone is not the open sesame for the hard of hearing, according to Dr. Fletcher. Studies made under his direction in the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company show that people whose hearing has been reduced by more than 60 per cent. can possibly be benefited by an amplifier, but they will never be able to understand what is said as well as persons whose hearing is better than 60 per cent. Hence the disappointment of many whose desire to reestablish communication with their fellow-men has led them to believe extravagant claims of certain unscrupulous deaf set manufacturers.

In explaining to his audience how the proper loudness is determined, Dr. Fletcher brought out several interesting points. A person having 30 per cent. less hearing than normal will have little difficulty in understanding ordinary conversation at three feet from the speaker. One having 40 per cent. less would miss many consonants, but could still follow the conversation by paying close attention. One who has 50 per cent. loss can hear only the vowel sounds, and can not understand unless the speaker talks loudly or close to his ear. With a 60 per cent. loss, nothing would be heard at all with the speaker three feet away, but by talking as loudly and close to the ear as possible, much can be understood. For greater deafness, no amount of loudness will be of much service, as the upper limit of the ear's response has been reached, and further increase will be painful or even injurious.

As a practical means of telling whether any device will be of assistance, Dr. Fletcher gave the following simple test: Have a friend speak simple sentences directly into your ear. If you can interpret them without difficulty, then a hearing aid can be designed which will make it possible to obtain the same interpretation. But if the speaker raises his voice to a very loud tone and you are still unable to understand, then probably no aids on the market can assist you.

The fallacy that deafened persons can hear better in noisy surroundings was disposed of by Dr. Fletcher with this explanation: The effect of noise is the same as an impairment of hearing. Noise in the average room is

equivalent to a 20 per cent. loss of hearing; New York's subway racket is as serious as 48 per cent. loss. Hence in a subway train the man of 48 per cent. deafness is on a par with his normal companion. Both shout, and both are heard equally well—or ill.

CANCER SERUM

Science Service

DOUBT as to the alleged efficacy of the curative serum for cancer said to have been produced by Dr. T. J. Glover, of Toronto, was expressed by many of the 15,000 physicians and surgeons assembled at Chicago for the conventions of the American Medical Association and affiliated societies.

It was pointed out by leaders of the American Medical Association that as long as three years ago Dr. Glover had made claims of being able to cure cancer. These claims were circulated among physicians with statements that the charge for one dose of the treatment would be five dollars and that at least five treatments must be given. The *Journal of the American Medical Association* quoted these claims in the issue of January 1, 1921.

The American Medical Association then referred the assertions of Dr. Glover to the Academy of Medicine, of Toronto, his home town, and a summary of their report was published in the *Journal of the American Medical Association* of February 5, 1921.

This report stated that "the data examined has not convinced the committee that the results obtained by the use of Dr. Glover's serum were better than those obtained by similar methods introduced by others, and which have ultimately disappointed the hopes entertained of them." It was further stated that Dr. Glover had declined to permit the committee to visit his laboratory or to examine his cultures or experimental material, and had not acceded to the request of the committee that he demonstrate his ability to produce cultures of cancer cells, to produce cancers by inoculation and to immunize animals against it.

Dr. Morris Fishbein, assistant to the editor of the *Journal of the American Medical Association*, in referring *Science Service* investigators to these published statements, said:

"Evidence indicates that controlled tests of the Glover cancer serum made by Francis Carter Wood, director of cancer research, Columbia University, show that the treatment has not the slightest effect on the growth of tumors of animals. The Glover method is in no sense established as either scientific or reliable."

AN ELECTRICAL DEVICE FOR PLOUGHING

Science Service

AN electrical method for making ploughing easier has been invented by E. M. Crowther and W. B. Haines, of the Rothamsted Experimental Station, England.

A large part of the work done in ploughing is "wasted" as friction between the mouldboard and the soil. The idea behind the present method is to use the soil moisture to lubricate the mouldboard.

By insulating the coulter of the plough and passing a current from it through the soil to the mouldboard the water in the film surrounding the soil particles is caused to move to the mouldboard, where it acts in the same way as water put on tools by men digging in sticky soil.

The inventors have demonstrated the method, both by small scale experiments in the laboratory and by actually measuring the work done by a tractor in ploughing both with and without a current flowing as described. A self-contained unit was formed by having a 110-volt dynamo mounted on and driven by the tractor. On the electrified plots the tractor engine had the extra load imposed by the dynamo. In spite of this it was noticed that the engine "eased-up" over the electrified plots and the time records showed that the speed of ploughing was increased. The current in this case was 1 to 2 amperes per plough.

Though the inventors claim that the device has reduced the work done in ploughing, they say that the amount of this reduction is not sufficiently great to have any immediate practical value. Up to the present they have used the ordinary plough, modifying it the minimum possible, but they are hoping to develop the idea further along such lines as adapting the plough to this particular purpose and in its application to special types of soil which give trouble in ploughing and to mole drainage.

RECENT WATER POWER INVESTIGATIONS MADE BY THE GEOLOGICAL SURVEY

Department of the Interior

ENGINEERS of the Geological Survey, Department of the Interior, surveyed 1,150 miles of rivers, mapped 46 dam sites and 21 reservoir sites, and made records of stream-flow at 1,600 gaging stations in 1923. Geologists of the survey examined the geologic structure at more than 50 proposed dam sites. The data gathered through the field work were analyzed and incorporated in reports on stream flow, water power and irrigation. The estimated potential power available 50 per cent. of the time on the streams surveyed amounts to 2,500,000 horsepower.

Water-power investigations must necessarily be made where the fall of the streams is greatest, and therefore much of the work is done in mountainous areas, where the population is scant and scattered and the means of communication are poor. The surveyors must follow the rivers, so that in many regions supplies can be carried only by pack train or by boat. As little baggage as possible is carried, for camp is moved almost daily.

About 200 miles of Colorado River were mapped, 24 dam sites were surveyed, and a geologic examination was made at each site. In this survey three boats furnished the only means of transportation. Accounts of this trip through the Canyon of the Colorado, relating its perilous adventures and its scientific results, have already been widely published. The water available for developing power in the canyon section of Colorado River is measured at gaging stations at Lees Ferry, Bright Angel Creek, in Grand Canyon National Park, and Topock. The measurements are made by current meters operated from cables, and the river stages are recorded by automatic gauges.

In Oregon about 300 miles of Rouge River and its

tributaries, 13 dam sites and five reservoir sites were mapped. In its upper stretches the river flows through an area traversed by good roads, but in its lower stretches there are no roads, so that boats were used. In its lower part, from Grant's Pass to the mouth, the river is very swift and difficult to run, but the survey boats made the trip without an upset. At one point, however, the rock walls approach each other so closely that one boat which was turned sideways by the current was lifted on a wave in such a way that it lodged between the walls, one end on each side, clear of the water. By good fortune the boat when pried loose was headed into the rapids and came throngh unharmed.

In the survey of Illinois River, a tributary of the Rogue, a pack train was used, except around Bald Mountain, where no trail follows the river. Here the supplies were transferred to a boat, but when the party had gone to more than half way around the mountain they encountered boulders so large and so close together that further progress by boat was impossible. The surveyors were then compelled to carry their instruments, food and bedding through a narrow canyon, whose sides were either densely wooded or consisted of bare, precipitous rock. In the bed of the stream deep pools alternated with rapids strewn with immense boulders. Progress along such a stream is slow and laborious. Many times the party climbed the steep sides of the canyon to avoid a pool only to be forced back by a precipitous cliff. The rock walls of these gorges, however, furnish excellent abutments for dams, and at such places the power development causes a minimum of damage to property.

Records of the daily flow of Rogue River are made at Prospect and Tolo, Oregon, and similar records are made on many of its tributaries.

Klamath River, in Oregon and California, was mapped for 100 miles, this work completing the survey of this river and its larger tributaries. Seven dam sites and two small reservoir sites were surveyed. A reconnaissance investigation was made of the power possibilities on Smith, Trask, Nestucca, Nehalem and Wilson rivers in western Oregon.

The western tributaries of South Platte River from Denver to the Colorado-Wyoming line were mapped, as well as Sweetwater and Encampment rivers, in Wyoming. In Colorado and Wyoming 460 miles of river surveys were made, and 14 reservoir sites and 12 dam sites were mapped.

ASPHYXIATING GAS STIMULATES BREATHING

Science Service

How the presence of carbon dioxide gas in the lungs stimulates breathing in asphyxiated persons, in spite of the fact that they may have been suffocated by too much of the same gas, was explained to members of the American Medical Association recently by Professor Yandell Henderson, of Yale University. In a method devised by him, carbon dioxide, which is always present in exhaled breath, is regularly and successfully used to start breathing in persons who, as the result of suffocation or other cause, have ceased to breathe.

The reason for this, Professor Henderson said, is that carbon dioxide in the lungs and blood is normally necessary to stimulate the nervous centers which control respiration. If a person who has been partly suffocated is given pure oxygen to breathe, or even fresh air, they not infrequently cease to breathe at all, due to the fact that pure oxygen in the lungs depresses the breathing nerve centers. The reason why people breathe heavily after exertion is because the exercise has burned more bodily fuel, and carbon dioxide has accumulated in the system.

Professor Henderson and his associate, Dr. H. W. Haggard, have devised a breathing apparatus which automatically feeds about 5 per cent. of carbon dioxide to the patient. This stimulates deep breathing and enables him to get rid of such really poisonous gases as carbon monoxide, which may have caused his collapse. Patients who have been treated in this way, instead of suffering for several days from severe headaches, are perfectly well in a few hours, and firemen who have been revived at fires are able to get up immediately and go on with their battle. The method is also used after anesthesia and generally in all classes of respiratory failure.

ITEMS

Science Service

THERE are 3,000,000 industrial accidents in the United States every year, besides an unknown total from motor vehicles, agricultural machinery and the many new hazards in play and in home life. These figures were given by R. M. Little, director of rehabilitation of the state of New York, in an address before the American Medical Association. To remedy this situation, the federal government and 36 states have established rehabilitation service for the physically handicapped, Mr. Little said, these bureaus are now caring for more than 11,000 active cases, and during the year ending June 30, 1923, they restored to economic independence 4,350 handicapped persons. It is estimated by Mr. Little that the injured were restored to active economic life at a cost of $253.84 for each person.

THE woodchuck or groundhog is facing extermination in regions where he is numerous enough to do material damage to farm crops. Difficult to hunt or trap, the little animal has always managed to survive even in thickly settled regions. But now the U. S. Department of Agriculture has found an easy and cheap way to kill them. One method is by a gas attack. Carbon bisulphide, a very poisonous liquid that vaporizes at a low temperature, is dropped down their burrows. The vapors are much heavier than air and sink to the bottom of the hole, where the woodchuck is taking his winter's nap, a nap from which he never awakens. The other method is to sprinkle flakes of calcium cyanide about the entrance to the digging. This is a deadly poison, and it gives off hydrocyanic acid gas, which is even more deadly.