SCIENCE NEWS

STIMULATION OF PLANTS BY ETHER

Science Service

No longer will useful plants be allowed to sleep out their long winter sleep if a discovery just announced to Science Service by Professor David Lumsden, of the Federal Horticultural Board, becomes the common property of nurserymen, amateur and professional gardeners and even farmers. For he has found that if given a "shot of dope," either by the inhalation or hypodermic method, they may be awakened as if by an alarm clock and set to their work of growing and producing flowers or fruit for the pleasure or profit of man.

The drug used in his experiments was the common ether of the hospital operating room, but instead of putting his plant subjects to sleep it woke them up. They liked it and seemed to thrive after just one treatment. For example, some plants were taken from outdoors in midwinter when they had to be dug from the frozen ground with picks, were given an overnight ether debauch and the next morning shoots of an average length of one eighth of an inch had sprouted. Kept indoors they continued to grow and flowers were produced weeks in advance of the usual blossoming season.

Roses were taken from the frozen ground and given a hypodermic injection of the same drug. Not only did they sprout and grow but, more important still to the indoor gardener, they were immune to all the ordinary plant diseases that make indoor rose culture a practical impossibility except in large greenhouses. Professor Lumsden has had roses in February, just six weeks from the time the plant was given its stimulating injection.

Only a very small quantity of ether is needed. In the inhalation method the plants are put in an airtight chamber containing 27 cubic feet of space. Five cubic centimeters of ether, or about a tablespoonful, are then introduced and the chamber sealed. Only about twelve hours exposure to the fumes is needed, and then the little plants are wide awake and growing.

In the hypodermic method Professor Lumsden made use of that sometimes formidable weapon, a woman's hat pin. With this a puncture about a quarter of an inch deep was made at the base of the stem of the plant where it joins the root. Then an ordinary hypodermic needle was introduced and half of one cubic centimeter of ether injected. This is the method which was generally used with woody plants such as roses or lilacs.

One of the important applications of this whole process, according to Professor Lumsden, is that using either method of drugging the plant, every single latent bud or shoot is brought to life. That is not nature's way, as usually only one of three or four ever grows. This may mean much in the culture of plants such as dahlias or potatoes which are grown from tubers. If every latent bud on these tubers could be made to grow they could be cut into smaller pieces and expense of seed saved. What is more, Dr. Lumsden believes that the plants would be more vigorous.

For he is working now to see if these ether treatments, especially the hypodermic sort, do not impart a lasting vigor to the plant, enabling it to resist disease. His experiments with roses strongly indicate this. If they are confirmed, ether "shots" will with plants take the place of the various forms of vaccinations to which the would-be healthy human is now subjected.

Finally, there is a mystery in this whole affair which science may some day solve, but of which it now knows little. Ether temporarily stimulates and then profoundly depresses all animal life. With plant life in moderate doses it is apparently all stimulation with no depression and no injurious after effects, but instead a lifelong increase in strength and endurance. If science can learn why this is so, much light will be thrown, Professor Lumsden says, upon the secrets of physiological growth.

THE WHALE'S SKULL

Science Service

THE speed at which whales are driven through the resisting water by their powerful caudal propellers causes the peculiar telescoping of the bones of their heads which has long puzzled scientists, so Dr. Gerrit S. Miller, Jr., chief of the division of mammals of the U. S. National Museum, suggests in a pamphlet just issued by the Smithsonian Institution. His explanation of the origin of this peculiarity as being purely mechanical is based on a study of the rapid swimming modern whales in comparison with their slower moving fossil relatives and with present day land and water mammals.

Whales were once land animals, but instead of the elements of their skulls joining evenly like those of the dog and other land mammals they are peculiar in that they show a highly developed system of "telescoping" by the slipping of one bone over another. The bone at the back of the head is forced forward and the bone which makes up the forward part of the face is forced backward over the central portion of the skull.

"With little doubt," Dr. Miller says, "this telescoping represents responses to stimuli which are in some way directly connected with the conditions under which these animals live."

Whales are born in the water and the young must acquire the ability to swim rapidly at an early age. There is no doubt that the habit of rapid swimming is established long before the skull has reached its full growth. The peculiar behavior of the skull may be connected with the fact that during much of that critical period in which the skull of an ordinary land mammal is rapidly and peacefully accomplishing its process of loose-jointed growth the skull of the young whale is fighting its way to adult size against the two opposing forces of body push from behind and water resistance from in front.

The Zeuglodonts, fossil cetaceans which were close relatives to the forerunners of modern whales, as well as sea-cows, have normal mammal skulls with no telescop-

ing of the bones. The resistance which water presents to a moving body increases as the square of the velocity, however, and if a whale swims three or four times as fast as a sea-cow its head will be subjected to from nine to sixteen times the backward pressure encountered by the head of the less rapidly moving animal. Sea-cows are known to be slow moving animals and that the Zeuglodonts of millions of years ago were less rapid than modern whales is evidenced by the fact they have smaller vertebral processes which serve as areas of attachment for the muscles that operate the tail.

TURKEYS FROM THE TROPICS

Science Service

WITHIN a few days a flock of beautiful occelated Honduras wild turkeys, collected in Central America by Harry Malleis, of the U. S. Biological Survey, is expected to arrive at New Orleans, according to Dr. T. S. Palmer, who is in charge of animal importations. These birds will be taken to Sapelo Island, Georgia, in the first attempt to introduce this tropical species into the temperate zone.

The Honduras turkeys are remarkable for their brilliant iridescent plumage. It is black tipped with brassy-green and fringed with greenish copper. The head is bright blue and yellow, and the rump region is steel-blue, with brilliant eyes of green-blue margined with copper marking the ends of the grayish tail feathers. It is said to be much more gaudy than the peacock, to be somewhat smaller than our eastern wild turkey, but to have even better meat.

Whether these turkeys can be successfully bred in this country will be determined on Sapelo Island. If these birds prove adaptable here, they may not only furnish a new game bird for sportsmen, but attempts to raise them in captivity will be made.

Experiments at zoological gardens indicate that this fancy bird will breed with our less colorful species. It is the only species of turkey, however, which is native to tropical lowlands. The Mexican turkey, from which our domestic turkey is believed to have originated, lives on the high table-lands. It has the characteristic white tipped tail feathers of the domestic bird.

Wild turkeys in Arizona and New Mexico show this feature, while turkeys of the Rio Grande valley of southern Texas are partly like the Mexican birds and partly like the Eastern wild turkey.

Our familiar bronze wild turkey's range was the eastern United States from Nebraska, Kansas and western Oklahoma, and eastern Texas east to central Pennsylvania and south to the Gulf Coast. It formerly ranged north to South Dakota, southern Ontario and southern Maine; but practically none are now found north of Pennsylvania and very few over much of the other part of its range.

QUARANTINE ON CHRISTMAS TREES

Science Service

THE old-fashioned Christmas tree will be scarce this year outside of New England, but if popular taste can be satisfied with substitutes there will be trees enough for everybody. The reason for the coming scarcity of the fragrant balsams and spruces which are so popular as Yuletide decorations is the quarantine which has recently been proclaimed by six states against all Christmas trees or greens shipped from any of the New England states, and the reason for the quarantine is to prevent further spread of the gypsy moth now prevalent over much of New England.

The bark of the little trees is a favorite spot for the gypsy moth to lay her eggs, where normally they live out the winter and hatch in the spring. Christmas trees are frequently thrown out on to dump heaps after the holidays and infected trees might therefore cause the introduction of the dreaded pest in remote parts of the country.

As the Christmas tree of commerce is the balsam or spruce, and as most of the supply of these trees has been taken from the forests of northern New England, the quarantine will create a scarcity of these trees in the states in which it is effective. These are Wisconsin, Michigan, New York, Pennsylvania, New Jersey and Maryland.

But even in those states there are good substitutes for the old-fashioned trees, according to Colonel William B. Greeley, chief forester of the United States. To a Science Service representative he stated that he "knew of no reason why the children should go without Christmas trees because of this quarantine. In the middle Atlantic states there is a large supply of scrub pines and cedars which make good decorative trees. New York has balsams and spruces of its own, and there is another stand in the Southern Appalachian forests."

Raising Christmas trees for the market has been made a successful business in some sections. Norway spruce is especially adapted for this purpose because it grows quickly, is decorative, and can be grown on light soils not suitable for farming purposes.

VARIATION IN CLIMATE

Science Service

THE Oldest Inhabitant may be right when he proclaims that "the weather wasn't like this when I was a boy." No less a scientific authority than Dr. Charles F. Marvin, chief of the U. S. Weather Bureau, in the course of a technical report on climatic changes, willingly gives the older generation its due and says in effect that science has in a way backed up some of its claims about a changing climate.

But these changes, Dr. Marvin says, are not permanent; merely "marked abnormalities which trend steadily in one direction and for many years away from that unchanging constant thing we may call the absolute normal climate." These trends may be as long as from 50 to 100 years in duration.

Rainfall records in New England going back nearly 200 years are given. These show that beginning about 1750 there was a more or less continuous and progressive diminution of rainfall for nearly 100 years, until in the middle of the last century it averaged several inches a year less than it did nearly three generations before.

Then the tide turned and a progressive increase in New England rainfall is noted, culminating apparently in 1905, since which date there has been an irregular decrease. A somewhat similar change, although of an opposite character, is noted also in Padua, Italy, where records go back to 1720.

As the result of his mathematical study of these records, Dr. Marvin says he is inclined to believe that fluctuations in climate have occurred and that minor changes can and do take place over restricted areas for relatively long periods of time.

"The evidence submitted will," he continues, "tend to justify the deep-seated conviction in the minds of a great many keen observers of mature years that weather conditions at the present time differ in material ways from corresponding conditions easily within their memory. Our fathers and grandfathers probably entertained like convictions, and while memory and personal impressions can not be accepted as safe guides, it is probably wrong to assume that such generally prevalent convictions are fictions of the imagination.

"There may be some foundation of fact in the ideas of the oldest inhabitants on the subject."

ITEMS

Science Service

A COMPLETE scientific survey of the Red Sea and adjacent coasts is being undertaken by the Italian Government. Three well equipped vessels and a large corps of scientists have started for the scene of the work. This will include the preparation of hydrographic maps of the sea itself showing currents, tides and dangers to navigation. Airplanes will be used for surveys and for aerological studies. The geology and mineralogy of the country will receive much attention and especial emphasis will be placed on a study of the flora and fauna, particularly of the possible development of fisheries. Phosphate rock and potash are known to exist in the region west of the Red Sea and these resources will be more accurately estimated. A lighthouse and radio beacon will be established on Cape Gardafui.

GELATIN, regarded by many as useful only for the making of insubstantial desserts, is given a high place in the human dietary by Dr. Thomas B. Downey, of the Mellon Institute of Industrial Research, as the result of a long series of experimental feedings of gelatin to animals and human beings. It has been shown by these experiments to aid in the digestion of milk and to be of great value in infant feeding. Dr. Downey explains this action of gelatin by stating that it acts as a protective coating over the globules of fat and of casein in the milk, causing them to remain finely divided and so preventing the formation of tough, indigestible curds.

INSUFFICIENT sleep causes impairment of memory according to recent researches on the subject of sleep by Profssors Engelen, Frerichs and Weygandt. The memory becomes unreliable even if the shortage of sleep has occurred for only a short time. Eight hours is the average needed for sleep, but brain workers sometimes require more. A reduced period of slumber may be partly made up for by increased intensity, a short period of deep, undisturbed sleep having the same effect as a longer and lighter one. The investigators also conclude that brain workers need a month of rest every year and that even longer vacations do not cause a lessening of acquired abilities but rather an intensification of them.

THE Liverpool Tidal Institute is making calculations which may take the "moaning" from many a ship's "crossing of the bar." Scientists of that organization report progress in their attack on the problem of the effect of strong winds in increasing or reducing the predicted height of tides. With the great increase in the size of ocean-going vessels, navigation in inshore waters has become vastly more difficult and responsible than it used to be. There has been an increasing demand for more accurate prediction of tides. Officers of large ships often find that meteorological effects are of great practical importance when they are preparing to enter or leave dock or cross a bar when the depth of water leaves a very small margin of safety. It is claimed that a strong wind blowing out in the Atlantic may alter the height of the tide in Liverpool harbor by one or more feet. The Liverpool Tidal Institute has done much since the last years of the war to give greater accuracy to tidal forecasts.

THE hum of industry sounds in the former homes of destructive prairie dogs of Douglas County in Colorado. Joseph Keyes, field representative of the U. S. Biological Survey in this district, has discovered swarms of bees going in and out of the old chimneys of the vacated burrows of thousands of blacktails and heard buzzing in the enlarged cavities below, which gave him every reason to believe that the prairie dog homes had been converted into honey warehouses. The burrows were made vacant by an intensive campaign of extermination directed by the government against these farm pests, which together with other rodents cause an estimated annual damage of over $300,000,000.

THE old belief that cattle are excited by the sight or the smell of blood has been dealt a severe blow by Professor G. M. Stratton, of the University of California. He has poured out buckets of blood before bulls, cows and calves without the animals showing more than mild curiosity. Cattle showed more interest in the blood of their own kind than in that of horses, but in no case was there any pawing of the ground or bellowing. Dr. Stratton attributes any excitement of cattle when one of the herd is bleeding to the cries of pain and the conduct of the wounded animal. A year or so ago he demonstrated by a similar series of experiments that red has no particular exciting effect upon bulls.

A RAILWAY in India recently made tests of a new type of concrete railway tie, constructed of two concrete blocks joined by a tie bar, rails being attached to specially treated wood plugs set in the concrete.

THE first state-owned public forest in the yellow-pine belt of the South was recently acquired by Louisiana through the purchase of a two thousand acre tract of timberland.