

FORESTRY

Pine Seedlings Won't Grow Unless Roots Have Fungi

PINE, spruce and other conifer seedlings frequently fail to grow when transplanted into prairie soil. Cause for these losses has been traced to lack of a certain type of fungous growth on their roots, by A. L. McComb and J. E. Sass of Iowa State College.

Seedling loss was particularly troublesome on new nursery sites where seedlings of jack pine, Norway spruce and other conifer species produced weak, straggly growth, or died when only a few inches high. Roots of these seedlings were found to be uninfected with the fungal threads known as mycorrhiza, which are found in the root tissues of healthy trees. Botanists believe that these fungi aid the trees in absorbing food materials from the soil.

The situation was remedied by inoculating the soil with surface litter from an older coniferous plantation, which contained the necessary fungi. Phosphorus seems to be the chief plant food material which the fungi enable the trees to absorb. Application of phosphate fertilizer without soil inoculation resulted in satisfactory growth, and the fungi appeared on fertilized seedlings.

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PHYSIOLOGY

Hormone Test May Answer Boy or Girl Question

THE QUESTION, Will it be a boy or a girl? asked by almost all expectant parents, might be answered by a test of the amount of male sex hormone excreted by the expectant mother months before the baby's birth, three British scientists suggest in a note to the editor of *Nature* (March 14).

Tests on 20 expectant mothers were made by Dr. Harold Burrows, Dr. Douglas H. McCleod, and Dr. F. Ll. Warren, of the Chester Beatty Research Institute at the Royal Cancer Hospital (Free) in London. Their idea is that if the unborn baby is going to be a boy, its sex glands may be producing enough male hormone to cause a recognizable increase of male hormone in the expectant mother's kidney excretions. The most likely time for a positive result in such a test, they state, would be early in pregnancy.

The average excretion of male sex hormone from 14 women who later gave

birth to boy babies was 26.2 milligrams per liter. The average amount excreted during the same stage of pregnancy by the six women who had girl babies was 14.6 milligrams per liter. The small number of expectant mothers tested, however and the fact that in individual cases there was no significant difference between the amounts of male hormone excreted by a woman who had a boy and one who had a girl, makes the test unreliable for immediate practical use. The scientists are unable to continue the research and report the work thus far with the hope that others may continue it and determine the possibilities of the test becoming practical.

The fact that the unborn baby's adrenal glands as well as the sex glands may be involved in the sex hormone excretion must also be considered.

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CHEMISTRY

No Rubber From Miracle, Leading Chemist Warns

NO CHEMICAL miracle will give the American public the rubber that it wants to shoe its tires, Dr. Thomas Midgley, Jr., inventor of the tetraethyl anti-knock material for gasoline, warned in receiving the Willard Gibbs medal, high chemical honor.

Fundamentally, America's acute shortage of rubber is due to the "mental slothfulness" of rubber experts who failed to separate rubber from plants growing in our own country and who do not yet know the fundamentals of rubber even though they have been studying this material for a century, Dr. Midgley said.

"Do not give credence to fanciful rumors that some mysterious inventor, like the White Knight in Alice in Wonderland, can suddenly supply huge amounts of rubber or a satisfactory substitute from nowhere," Dr. Midgley said.

He blamed the confusion that has existed among rubber chemists to a lack of appreciation that natural rubber contains two kinds of rubber, a sol rubber and a gel rubber that seem to be chemically the same but physically are different. Sol rubber vulcanizes to a useful product, while gel rubber does not unless it is mixed in the air to give a material quite similar to sol rubber.

Extension of rubber chemical theory might well lead, Dr. Midgley said, to better and less expensive synthetic rubbers than we now have.

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IN SCIENCE

PHYSICS

Babylonian Influence Seen In Thermometer Markings

VESTIGES of ancient Babylonian influence can be found in the scale of our ordinary Fahrenheit thermometer, according to a communication of Carl B. Boyer of Brooklyn College, to *Science*. The Babylonians counted by sixes and sixties, the sexagesimal system, instead of by tens and hundreds as we now do in the decimal system. They divided the circle into 360 equal parts, and we still measure our angles by these "degrees."

Early in the eighteenth century, Roemer, under Babylonian influence, made thermometers the scale of which was 60 degrees from the zero to the boiling temperature of water. Fahrenheit, who continued his work, found these degrees too large for practical purposes and subdivided them into four equal parts, giving 240 degrees for the same range. In later modifications, the degrees were slightly changed again, bringing the boiling point down to 212 degrees where it now stands.

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ENGINEERING

Foods Self-Refrigerating On Voyage to England

PERISHABLE foods are now being made to refrigerate themselves on American cargo ships, using an ingenious plan made public by the United States Department of Agriculture. Lard, chilled to a zero temperature or lower, is the refrigerating agent. By lining the holds of ocean-going ships with insulating material, packing large containers of the refrigerated lard to form a floor and walls around perishable foodstuffs, placing more lard over the top, and adding a final cover of insulation, the shipment is kept safely cold.

The system has been adopted to keep Axis submarines from stopping shipment of perishables to United Nations ports by systematically sinking refrigerator ships. It has the added advantage of saving space.

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E FIELDS

PHYSIOLOGY

Don't Stuff on Carrots For Good Night Vision

GOOD NEWS for the aviators who don't like carrots and spinach! Stuffing with these vitamin-rich vegetables won't make you see any better at night unless you are vitamin starved to begin with. U. S. Navy's new Night Vision Board says the use of large extra doses of vitamins, more than one would get in a liberal well-balanced diet, will not improve night vision above normal.

Vitamin shortages do result in impaired night vision, the Board says, and on submarines, small ships or long cruises where adequate supplies of fresh foods cannot be carried, vitamin capsules or pills can be prescribed by medical officers to make up for diet deficiencies and keep the men's night vision always up to peak fitness.

The best diet in the world set out daily on your table won't keep your eyes fit for night duty, however, if you always push aside the fresh vegetables, green salads, fruit and milk and eat only meat, potatoes, bread, pie, sweets and coffee, the Navy physicians warn.

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MEDICINE

Gum Trouble Traced to Modern Sleeping Medicines

PHENOBARBITAL and related sedative drugs may cause a kind of gum trouble that can be mistaken for trench mouth, Dr. John C. Gable, of Woodward, Iowa, reports (*Journal, American Dental Association, June 1*).

He discovered this when he became a member of the dental staff of the Iowa Hospital for Epileptics and School for Feeble-minded, where he found "hundreds of patients were being treated for so-called trench mouth."

The usual treatment for trench mouth failed to clear up the condition and it was decided that the trench mouth spirochete was not the sole cause.

"The condition was confined to patients who were being given either

phenobarbital or dilantin (a new epilepsy remedy) or both," Dr. Gable observed.

From a dentist at another state institution, pharmacists and veterinarians, Dr. Gable subsequently learned that these scientists also had found that phenobarbital and dilantin, when given over long periods, caused gum inflammation, sometimes with a bluish discoloration.

Thorough brushing twice daily, cutting away diseased parts of the gum when necessary, painting with a saturated solution of tannic acid in glycerine and application immediately after of a 5% solution of chromic acid are the chief features of the treatment Dr. Gable uses for the condition. He concludes, however, that "nothing has been brought out as yet that will counteract the effects of the drug. Local treatment is only palliative."

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INVENTION

New Sight For Rear Gunner Permits Streamlining

A NEW telescopic sight for the use of rear gunners on bombing planes, just patented by Wolfgang B. Klemperer of Los Angeles, makes better streamlining of the fuselage possible and at the same time gives a wider arc of fire for the protection of what is now the most vulnerable of all points on a bomber—the rear.

At present, with his sights fixed rigidly on the gun, the gunner must move from side to side in order to fire in any direction other than dead astern. This necessitates making the tail gunner's position wide enough to let him slide back and forth, thereby producing a thick, lumpy tail instead of one tapered to a point as good aerodynamics requires.

In Mr. Klemperer's invention, a fairly wide-angled fixed telescope is provided with a movable sighting reticule, so connected with the gun that the sighting cross-lines are on the target when the gun is in proper firing position. The gunner can therefore sight accurately by moving only the gun, and without needing to shift his position or sway his shoulders and head. To give a wider angle of fire, segments of the pointed tail are hinged to open like the petals of a flower just before firing.

Rights in Mr. Klemperer's patent, no. 2,281,772, are assigned to the Douglas Aircraft Company.

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ASTRONOMY

New Planet May Be Added To Sun's Family of Nine

A NEW planet about the size of Pluto but a little less distant may be added to the sun's family, which already contains nine members.

No such tenth member has yet been found, but the attraction of such a body would account for the three days' delay in the return of Halley's comet in 1910, according to the calculations of Dr. R. S. Richardson of Mt. Wilson Observatory reported in the *Publications of the Astronomical Society of the Pacific* (February). And he has told astronomers just where to look for the new body. It should now be found, he says, at about right ascension 16 hours, declination minus 20 degrees. These figures enable astronomers to point their instruments directly at the suspected spot.

At first, Dr. Richardson thought Pluto might be the culprit that held back Halley's comet. But it turned out that Pluto was miles away at the time—in fact, more than three billion miles away. This was the very closest the planet ever got to the comet, and it happened in October, 1901. Also Pluto is so tiny, only about as big as the earth! Finally, Dr. Richardson's very careful calculations showed that if Pluto had any effect at all, it was in the wrong direction; it would have hastened rather than delayed the comet.

Pluto moves in an orbit at a mean distance of 3,700,000,000 miles from the sun, which is nearly 40 times the earth's distance, 93,000,000 miles. Pluto's nearly circular orbit is so large that the whole of the long and narrow orbit of Halley's comet falls well within it, with a margin of about a billion miles. The comet requires 77 years to traverse its orbit, while it takes Pluto 248 years.

What is needed to explain the comet's dilatory behavior, Dr. Richardson found, is a planet whose orbit just grazes the furthestmost tip of Halley's orbit, grazes it by about 9,000,000 miles. The planet would be about the size of Pluto or the earth. A larger planet at a greater distance would also do the trick, but the planet must be small because otherwise it would have been discovered.

If this planet is found, it will be the third to have been predicted mathematically and afterwards discovered. The other two are Neptune, discovered in 1846 from the calculations of Leverrier and Adams, and Pluto, discovered in 1930 from the calculations of Lowell and Pickering.

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