PLANT PHYSIOLOGY

Bacteria Help Produce Starchless Potatoes

POTATOES practically without starch, which is the very essence of potatoes, have been raised under experimental conditions by Dr. R. F. Suit of Macdonald College and Dr. Harold Hibbert of McGill University, Montreal, by injecting into their stems cultures of bacteria that have the power of changing starch into sugar-like compounds.

Previous researches by Dr. Hibbert had shown that certain species of bacteria secrete enzymes that change starch and cellulose into sugars and related compounds, when they did their work in glass vessels. It was decided to try whether these same enzymes could work the same changes "in vivo," that is, in a living organism.

Accordingly the main stems of young potato plants were cut off, and quantities of one of the bacterial species were injected into them at frequent intervals until the plants were mature. Then the tubers were dug up and tested for starch by the familiar iodine reaction, which produces a vivid purple color wherever starch is present.

Slices of the tubers, when thus tested, showed a purple ring for about an eighth of an inch around the outside, but no purple color whatever in the center, where starch is usually most abundant. The food stored in these potatoes was evidently in some form other than starch.

Science News Letter, February 3, 1934

NAVIGATION—PHYSICS

Cathode-Ray Finder Would Locate Ships

A NEW type of direction-finder, incorporating a cathode-ray oscillograph, has been devised by L. H. Bainbridge Bell, of the Government Radio Research Station at Slough, Buckinghamshire, England. It shows the bearing, course and approximate distance of all large shipping within a distance of ten miles, provided that the ships are sending out the signals required by the new system.

The instrument has a dial marked with the points of the compass. Whenever signals are received bright green arrows appear behind the dial. The direction of each arrow gives the bearing of the corresponding ship and its thickness indicates her distance. The approximate courses of the ships are deduced as soon as subsequent signals are received.

If the arrow has become thicker the ship is approaching the course of the ship receiving the signals, and if it steadily continues to become thicker the receiving ship must alter her course to avoid a collision. A more exact determination of the course can be obtained by the usual triangulation principle.

If the system is internationally adopted all fogbound ships will send out every twenty seconds a signal consisting of a Morse "dot," the signal itself lasting only a thousandth of a second, so as to reduce interference to the minimum. The signals are received on two fixed loop-aerials, mutually perpendicular, which are connected to electrically similar amplifiers. The outputs from these amplifiers, at the original radio frequency, are applied to the two pairs of deflecting plates in a cathode-ray oscillograph. The screen of the oscillograph forms the indicating dial of the instrument.

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AVIATION

Airplane Cabin Made Quiet as Other Vehicles

NOISE within airplane cabins can now be suppressed so effectively that airplanes can be made to compare favorably in noise characteristics with other transport vehicles, Stephen J. Zand, aeronautical research engineer of the Sperry Gyroscope Co., told the Society of Automotive Engineers.

By using a special acoustic absorber consisting of an inexpensive stretched fabric to which is cemented a special felt, an airplane cabin can be soundproofed so as to reduce an outside noise of 90 decibels to less than 75 decibels. A 90 decibel level of sound is distinctly troublesome but conversation in normal tones can be carried on when the noise level is from 65 to 75 decibels.

The soundproofing of the airplane cabin can be accomplished by materials weighing only 200 pounds or about 15 pounds per passenger, an increase of 100 pounds or 7½ pounds per passenger over inside coverings of the cabin without soundproofing qualities.

It was found that the noise level in the cabins decreased with increased altitude, a noise of 73 decibels on the ground decreasing to 60 decibels at an altitude of 20,000 feet.

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IN SCIEN

ASTRONOMY—PHYSICS

Seven-Foot Elbow Room Assigned to Molecules

TAKE ALL the molecules in the universe. Distribute them evenly. Each would be separated from its neighbor by a distance of seven feet.

Prof. William D. MacMillan of the University of Chicago has arrived at this figure, using Dr. Edwin P. Hubble's estimate of the number of "island universes" or nebulae far beyond our own Milky Way galaxy.

Dr. Hubble drew his conclusions from a count of nebulae on 1,283 photographs taken with Mt. Wilson Obsertory's 60- and 100-inch telescopes. On these photographs covering two per cent. of the three-quarters of the sky seen from Mt. Wilson, Dr. Hubble found approximately 44,000 nebulae. With even distribution of nebulae in the universe, there would be about 75,000,000 of these gigantic star systems in the vast space sphere visible to the largest telescopes. Light takes about 300,000,000 light years to come to earth from the outposts of the visible universe.

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ORDNANCE

Plugged Barrels Cause Shotgun Failures

WHEN a shotgun barrel bursts, you may be sure that the cause was some obstruction in the end of the barrel, not an overloaded shell or obstruction at the breech. This is the conclusion of Prof. William J. Conley of the University of Rochester after experiments in which he used shotguns salvaged from junk shops.

Double and triple loads had no effect on the ramshackle 12 gauge guns, but when the gun's muzzle was plugged with mud or snow the barrel invariably burst or bulged near the end. Even half an inch of soft snow in the muzzle resulted in an explosion of a gun held in a vice, so violent that a piece of it flew back 50 feet and hit the door shielding Prof. Conley.

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CE FIELDS

PALEONTOLOGY

Fossils of Ice Age Animals Found Near San Diego

FOSSIL remains of a small Ice Age horse and a giant mammoth which roamed San Diego county 100,000 years ago have been found by Civil Works Administration employees in Mission Valley, San Diego, Clinton G. Abbott, director of the San Diego Natural History museum, has announced.

The remains, several teeth of the horse and a section of the spinal column of the mammoth, were identified by Charles H. Sternberg, paleontologist of the museum.

Only once before have signs of either of these animals been discovered in San Diego county. Two years ago, in a well at San Ysidro, near the Mexican border, a tooth of the Ice Age horse was found, and twenty years ago a mammoth tooth was discovered in San Diego.

"It is hardly possible to set a value upon such a find," Mr. Abbot said. "These animals were extremely rare in this part of the world. It is certainly the greatest paleontological discovery in my experience."

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ENGINEERING—RADIO

Short Wave Phone System Serves Bridge Builders

See Front Cover

CURIOUSLY, radio is helping to build a bridge.

Special short wave transmitting and receiving sets make possible communication among groups of contractors scattered on land and water along the eight and one-quarter mile route of work on the San Francisco-Oakland bridge. These men on the job also talk with the head offices and with the office of the state engineer in San Francisco.

The picture of building activity on the cover shows the San Francisco anchorage for suspension cables as it rises to its full 68,000 cubic yard statue. Steel grillage and eyebars, to which the 28-inch diameter cables will be attached, are being embedded in the concrete. The monolith will be 160 feet high, 108 feet wide and 184.6 feet long and is being cast sectionally in interlocking blocks to offer greatest resistance to the pull of the cables.

The bridge is to be a two-deck suspension structure with steel towers rising from 465 to 505 feet which will give boats clearance at high water of from 180 to 214 feet. The upper deck will carry a 58-foot roadway with six traffic lanes for passenger automobiles and light trucks while the lower deck, 31 feet wide, will bear three traffic lanes for heavy trucks and two for interurban cars.

A tunnel 540 feet long, 80 feet wide and 60 feet high is a part of the project. It pierces government owned Yerba Buena island in San Francisco Bay. Anchorages, piers, tunnels and other features of the project are under construction.

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PALEONTOLOGY

Professor's Sacrifices Make Institution Possible

AFTER four decades of work in the collection of paleontological and geological type specimens and exhibits, Prof. G. D. Harris of Cornell University has secured a charter from the State of New York for an institution which has been his dream for years. The Board of Regents of the State of New York has granted a charter to the Paleontological Research Institution located in the city of Ithaca and founded by Prof. Harris. It has long been his hope that this should become a national institution and its realization will encourage him to continue with the laborious task of cataloging and collecting thousands of specimens.

When Prof. Harris's numberless specimens from the two Americas at last outgrew the storage space in his office-quarters at the University, he saved up $3,000, built a fireproof museum in his yard and named it the Hall of Types.

The cataloging and collecting which has been going on these forty years has resulted to date in the printing of ten huge volumes on the specimens. These books were printed on his own press, in his basement, by himself. He bought the press with his own funds out of a salary that until ten years ago was not more than $1500 a year. Summers he worked extra to get money for geology expenses.

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ENTOMOLOGY

Mosquitoes Dyed Pink For Study

IF YOU see pink mosquitoes (or blue ones) this spring when things warm up again, don't jump to the conclusion that repeal has had a reducing effect on the old familiar pink elephants. The insects' pinkness (or azureousness) will mean only that they have been marked by an inquiring entomologist, who wants to know how long they live, where they go to lay their eggs, how far they can migrate, or other intimate details of their lives of evil, to the end that he may reduce the slap-and-scratch batting average of your community and its incidence of malaria.

The new method of giving mosquitoes distinctive and conspicuous colorings was devised by entomologists of the U. S. Department of Agriculture. It consists in spraying them with an exceedingly fine mist of either methylene blue or eosine, the latter a strongly pink dye. The spray must be very fine, to avoid drowning the insects; but if the nozzle is properly adjusted the mosquitoes dry off in a few minutes and fly away—marked for life.

How long one of these fragile structures of wings, legs and biting apparatus can survive the threats and buffetings of this rough world was vividly shown by a tinted mosquito in the Columbia river region. This veteran was still on the job 104 days after its blue baptism. Some of its companions of the same spray bath were found at a distance of four or five miles.

Science News Letter, February 3, 1934

SEISMOLOGY

Acapulco Earthquake Near Mexican Coast

SUNDAY'S severe earthquake, which caused great damage in the Mexican seaport of Acapulco and other towns in Guerrero, had its epicenter, or point of most violent activity, at sea. Scientists of the U. S. Coast and Geodetic Survey located this epicenter after studying data collected from a number of American and Canadian seismological observatories by Science Service.

The geographic coordinates of the point were given as seventeen degrees north latitude, one hundred degrees west longitude, and the time of origin was 2:09.9 p. m., Eastern Standard Time.

Science News Letter, February 3, 1934