

BOTANY

Corn Roots Nearest Plant Absorb Water Best

CORN roots push themselves deep and far through the soil, yet the ones that are nearest the parent plant are most efficient in absorbing water.

This has been demonstrated in experiments at Tucson, Ariz., by Dr. Charles H. Davis of the University of Arizona. Dr. Davis grew young corn plants in boxes of soil which permitted the development of a four-foot spread of roots, each box provided with one glass side, so that the roots could be accurately counted and measured.

Measurements of soil moisture, taken every four inches along the length of the boxes, showed that roots nearest the plants absorbed water faster than did longer roots pushing out to greater distances. Not only that, but the shorter roots were able to extract water from soil dried to a point at which the plants theoretically should have wilted, and at which they actually did wilt when the roots farther out had to attempt the task of extracting water a little later on.

Dr. Davis' experiments will be reported in detail in the *Botanical Gazette* (June).

Science News Letter, July 13, 1940

INVENTION

Resin From Cashew Nuts Among New Inventions

TWO, AT LEAST, of 851 patents granted recently by the United States Patent Office are for war implements. To Michael Watter, of Baltimore, is granted patent 2,203,345, for a gun turret to be used on an airplane. It is essentially a ball and socket device, made out of a transparent plastic. The ball part, which moves so that the gun can quickly be pointed in any direction, is mounted in a transparent section of the plane's covering, so that the gunner has an entirely clear view. Yet the opening is sealed, and no air can enter through the gun opening.

John Hines, of Astoria, Long Island, and Louis Segal, of New York City, were granted patent 2,203,640, for an improved hand grenade.

The shells of cashew nuts may be used to give a useful resin, by using the method of three North Tonawanda, N. Y., inventors, Alvin F. Shepard, Joseph F. Boiney and Lothar Sontag. The resin is produced by a heating

process applied to the oil extracted from the shells. This was granted patent 2,203,206.

Two different inventors received patents for applications of the fountain pen idea; one to a brush, the other to a soldering iron. The former, granted patent 2,203,361, is the invention of Thelma F. E. Pound, of Ellensburg, Wash. A supply of some liquid, which might be applied by the brush, is contained in the handle, and there is an electric element to heat the liquid.

Thomas J. Hallwood, of Columbus, Ohio, invented the soldering iron, and was granted patent 2,203,299. This also is electrically heated. The solder is admitted through the handle, a heating element melts it, and it flows out through a hole in the iron's point.

A device that will produce echo effects, on a radio program, for instance, is a product of the ingenuity of Peter C. Goldmark, of New York City, recipient of patent 2,203,352. Connected to the circuit from the microphone current is a glow lamp which varies in brightness with the sounds. The light from the lamp is focussed on a turning drum covered with a phosphorescent material. This has the property of glowing for a time after a light shining upon it has been shut off.

Thus, the surface of the drum briefly assumes a pattern of light and dark corresponding to the sound waves. Over another part of the drum there is a scanning system where an electric eye watches the light and dark areas converting them back into electrical energy, and this in turn is fed into the microphone circuit. When the varying currents are reconverted into sound, there is the original and then the echo, produced from the phosphorescent drum. By varying the speed of the drum, the lag of the echo may be changed. When any part of the drum has turned completely, the glowing has faded, and it is ready to record again.

Two novel inventions were a falseface and an illuminated hat. The first has flexible pouches, connected to a mouth-piece, so that the wearer can inflate various parts at will, making his nose, cheeks, etc., apparently swell to large proportions. This won patent 2,203,562 for George L. Edwards, of Fuquay Springs, N. C.

The illuminated hat, for which patent 2,203,028 was issued to Louis W. Parrillo, of New York City, has a switch at the wearer's forehead. When he wrinkles his brow, the light is turned on.

Science News Letter, July 13, 1940

IN SCIEN

ICHTHYOLOGY

Fisherman Sets Record With Broadbill Swordfish

WITH the catching of two rare broadbill swordfish in a single day, a feat he has performed twice before, Michael Lerner, head of the American Museum of Natural History's Fifth Big Game Fish Expedition, has set a new record. Since the first was captured in 1913, less than 300 of these fish have been caught by sportsmen in the entire world. Only three others have caught two in one day.

Mr. Lerner's expedition has been operating for the past three months off the coast of Peru and Chile, to determine if the swordfish and marlin found there are the same as those found near New Zealand and Australia, where studies were made last year.

Science News Letter, July 13, 1940

ORNITHOLOGY

Nine-Inch Bird Has Three-Foot Tail

THE LONGEST-TAILED bird for its size ever found is a new bird-of-paradise species newly added to the collections of the Australian Museum, Sydney. The bird, which trails a three-foot tail after a nine-inch body, was collected in New Guinea by J. L. Taylor and J. R. Black, leaders of the recent Hagen-Sepik patrol.

The long tail, which grows only on the male bird, consists mainly of two ribbon-like white plumes. The body and wings are brown, with metallic green throat and head. At the upper base of the bill there is a large tuft of velvety feathers shot with green, while a fiery copper band runs across the chest. The female is reported to be a plain brown bird.

Like all its tribe, this new bird-of-paradise concentrates its beauty in its feathers. Its voice is described as a clicking or hammering noise, like a riveter at work.

It has been given the name McNicholl's ribbon-tailed bird-of-paradise, after Sir Walter McNicholl, Administrator of New Guinea.

Science News Letter, July 13, 1940

CE FIELDS

PHYSICS

Articles for Sale Now Shown in Three Dimensions

BATHING SUITS and other things for sale, as well as scenes of geographical and scientific interest or personal photographs, can be shown in three dimensions upon the screen through use of a commercially available projector. Photographs in either black and white or color are taken with stereoscopic camera. Projector uses differently polarized light in throwing upon the screen the two images. The eyes of the audience, looking through differently oriented polaroid glasses, see the pictures on the screen in such a way that the illusion of three-dimensional depth is created. Like a machine gun the new projector is loaded with 35 slides. A punch of a button by the lecturer brings a new scene to view. (Manufacturer: Three Dimension Corporation, New Holstein, Wisconsin).

Science News Letter, July 13, 1940

GEOLOGY

Ordinary Earth Minerals To Yield New Materials

THE MANUFACTURE of useful synthetic substances from common minerals in the crust of the earth promises to be among the most useful technologic accomplishments of the future.

The synthetic organic chemicals industry has poured out in recent years drugs, dyes, perfumes and other chemical products by the thousands, made largely from the complexity of coal's molecules. Far less complex substances, such as clay, graphite, etc., are due to come into the technologic limelight.

Most exciting, perhaps, is the possibility of making artificial diamonds of industrial usefulness from graphite by the use of high pressures combined with high temperatures. Both the diamond and graphite consist of the single element, carbon. Found only in unusual localities in the earth's crust where in past ages conditions of heat and pressure have been right to result in their formation, diamonds are potentially much more useful technologically than they are as jewelry.

The extreme hardness of diamonds causes them to be used in drills and for cutting operations, despite their cost. Diamonds used for these purposes are usually black or dark in color, not the flashing white of those used to adorn fair ladies.

If diamonds could be made synthetically at a reasonable cost, they would find wider use than they do in working metals, drilling and other such tasks. As a matter of fact, years ago artificial diamonds were made for practical use.

The new hope for artificial diamonds comes as a result of extremely high pressures achieved at both Harvard and the Carnegie Institution's Geophysical Laboratory, in the neighborhood of 3,000,000 pounds per square inch. One of the experiments made at Harvard was the application of this pressure to graphite in the hope that pressure alone would make the change from graphite to diamond. The attempt was not successful. When high temperature is combined with high pressure, the result may be different. (See SNL, March 9)

From clay there has been made through research at the Massachusetts Institute of Technology a synthetic mica that potentially makes America independent of the supplies of mica from Madagascar that might be interrupted by war conditions. Clay and mica are closely related in chemical composition, silicon, aluminum and oxygen being their chief constituents. Clay is pressed out into a sheet, which is hard and brittle. If this untreated sheet is placed in water, it swells as clay will. But if it is first treated with a lead salt, the lead enters into combination with the atoms of the clay sheet in such a way that it keeps out any other substances, such as water, that come along. A synthetic mica is formed. (See SNL, July 22, 1939)

This substance, called Alsifilm, is being manufactured by five companies already and is finding extensive use as an insulator in all sorts of products, among which are electric toasters for your table.

Research may be expected to find similar ways of treating other common inorganic minerals in order to produce substitutes for existing materials or substances with new combinations of properties fit for new uses. As in the case of the synthetic mica, many of these new developments will be worked out from the theoretical chemistry of the substances involved. By learning how the atoms are arranged, science is able to design new substances and then attempt to build them in the laboratory.

Science News Letter, July 13, 1940

AGRICULTURE

Invasion Won't Damage American Cattle Industry

IF GERMAN invasion of the little cattle-raising Islands of Jersey and Guernsey off the French coast should cut off completely United States importation of Jersey and Guernsey cattle, it would have no important effect on the cattle industry of this country, in the opinion of experts here.

We already have in the United States 237,430 registered Guernseys and 252,811 registered Jerseys. These are the pure bred cattle, both of whose parents were registered pure breeds. In addition there is a much larger number of those known as "grades" which are the Jersey or Guernsey strain, but which are not eligible for registration. Of these there are 3,700,000 Guernseys and 10,000,000 Jerseys.

Since there were probably not more than about 20,000 Jersey cattle on the Island of Jersey before the war, the cutting off this source of supply will not materially damage our supply of this breed.

Imports of Guernseys have totaled only 52 in the last decade, and we have brought in from Jersey only 1,749 head—all registered cattle. The last importation was only about six weeks ago.

Science News Letter, July 13, 1940

GENERAL SCIENCE

Sigma Xi Headquarters Is Moving to Yale

SIGMA Xi, the national honor society promoting research, is moving its headquarters to Yale University after having maintained them at Union College, Schenectady, N. Y., for more than 18 years.

At the same time Dean Edward Ellery of Union College becomes national president after having been national secretary since 1922. Dr. George A. Baitsell, Yale professor of biology, becomes national secretary after a term as national president.

During Dean Ellery's long administration of Sigma Xi the membership has grown from 15,000 to 40,000 and the active chapters in universities and colleges have risen from 36 to 80. Dean Ellery this year retired from the Union College and during the next two years will continue to devote himself to the upbuilding of Sigma Xi.

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