

PHYSICS

Walnut-Sized Searchlight Visible 65 Miles at Sea

➤ A SEARCHLIGHT about as large as a walnut, which will project a 1,500 candlepower beam of light that can be seen 65 miles away, will probably soon be standard equipment in the life rafts for aviators forced down at sea.

This new lamp was designed by Westinghouse at the request of the Navy. It will be worn on a band around the head. It is a six-watt lamp with one-half of the bulb silvered to provide a reflector. By means of a switch it can be used to flash signals.

The lamp will be wired to the small hand-cranked generator now included in life raft equipment to supply power to radio transmitter which automatically sends out an S.O.S. Vessels picking up this distress signal can follow it to within some ten or twelve miles of the life raft, and then must depend upon some visible signal.

The lamp is mounted in a waterproof housing to protect it from injury. It contains a single tungsten filament. Its life is approximately 100 hours.

Science News Letter, June 19, 1943

MEDICINE

Arrow Poison Aids Study Of Muscle Weakness Disease

➤ A CLUE that may help in the search for the cause of myasthenia gravis, chronic, progressive disease of muscular weakness, has been discovered by Prof. A. R. McIntyre and Dr. Ray E. King, of the University of Nebraska College of Medicine.

The clue came from studies of d-tubocurarine, a chemical from one of the plants used in making old South American Indian arrow poison, curare.

This chemical, the Nebraska scientists report (*Science*, June 4) will make a muscle contract even when there is no nerve connection to the muscle. The findings seem to prove that the chemical acts directly on the muscle and not on the nerve mechanism or end plate of the nerve on the muscle fiber.

When curare is present at the surface of the muscle, it probably prevents acceptance by the muscle of acetylcholine, which is a chemical transmitter of stimulation from nerve to muscle. The nerves, on stimulation, go on sending out this chemical transmitter, but the muscle does not respond to it.

In myasthenia gravis, the muscles also fail to respond. The chemical used to treat this condition acts like acetylcholine, preventing the action of a body enzyme which inactivates acetylcholine. But the curare chemical's effect on muscle has nothing to do with this acetylcholine-inactivating enzyme. It apparently just keeps the muscle from using the acetylcholine.

Some similar chemical, the findings suggest, may be blocking acceptance of a chemical transmitter of nerve stimulation in myasthenia gravis. As the Nebraska scientists put it, their findings "provide a possible clue as to the type of substance to look for as the causative agent in myasthenia gravis."

Science News Letter, June 19, 1943

PUBLIC HEALTH

Current Health Picture Is Called Encouraging

➤ RECENT NOTABLE declines in maternal and infant mortality, coupled with new low records for many of the communicable diseases, form an encouraging current health picture. The extent of sickness and death and the growth rate help measure the vitality of the population, Miss Clara E. Councill, associate statistician of the U. S. Public Health Service, told an informal meeting of the Population Association of America.

Maternity and infant care is being provided for wives and children of enlisted men through an expanding program now covering some 30 states, she revealed. About 5% of the births in this country for the year ending July first will be to wives of men in the armed forces, it is estimated.

Early 1943 reports show a continued downward trend in infant mortality despite war conditions.

"The latest information available indicates that the birth rate continues to rise," Miss Councill announced, but predicted that a continuation of the war will result in a marked decline.

Speaking of industrial absenteeism, she stated that the estimated loss through sickness and injury of war workers is estimated to be about 6,000,000 workdays every month. The great majority of absences are of short duration—one to three days.

"These are sometimes charged to illness," Miss Councill suggested, "but probably more truthfully should be attributed to maladjustment."

Science News Letter, June 19, 1943

IN SCIEN

INVENTION

Improved Smokeless Powder Has Uniform, Tough Grains

➤ AN IMPROVEMENT in smokeless powder, producing more uniform, less fragile grains, that will burn more evenly and hence produce more uniform propulsive effect, is the invention of B. H. Mackey of Wilmington, who has assigned rights in his patent, No. 2,320,243, to E. I. du Pont de Nemours and Company.

Smokeless powder, Mr. Mackey explains, is produced by squeezing a pulpy dough through numerous openings, forming strings, which are then cut up and dried. But since the dough moves in one direction only, its minute internal grains are all arranged in the same direction, so that shrinkage on drying changes the shape of the final pellets, and also leaves them rather breakable.

The present invention avoids these difficulties simply by introducing a twist into the path through which the powder-dough strings are forced. This throws the internal graininess into all directions, making for more uniform, less fragile pellets after drying.

Science News Letter, June 19, 1943

NUTRITION

Vitamins Are "Exploded" Out of Yeast Cells

➤ VITAMINS and other desirable yeast products are extracted from the yeast cells by a process reminiscent of that used in producing puffed-grain breakfast cereals, in an invention presented by W. P. Torrington, of New York, for patent 2,319,831. The yeast culture is placed in a sealed tank, where it is subjected to high pressure induced by the introduction of carbon dioxide gas. Then it is suddenly shot into another container where a condition of partial vacuum prevails. This causes the release of certain of the valuable cell constituents into the fluid, which can then be separated off and the products extracted.

Rights in the patent have been assigned to the Emulsions Process Corporation.

Science News Letter, June 19, 1943

CE FIELDS

STATISTICS

New Ph. D. Degree Granted In Statistics at Columbia

► NEARLY TEN YEARS of research in developing statistical methods, many with military uses, has led to the establishment of a new Ph. D. degree in mathematical statistics just announced at Columbia University by Dean George B. Pegram of the Graduate Faculties.

Wartime uses of the subject include determining the probabilities of certain combinations of hits in bombing and artillery fire, sampling inspection of guns and ammunition, and in military meteorology. Medical research in tropical diseases also employs statistical methods.

There is a serious shortage of people who can handle the many new powerful and accurate statistical methods recently discovered. Such experts are needed by the Army, Navy, war industries and various branches of the government.

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ORNITHOLOGY

On-Edge Nest Holds Eggs Stuck With Natural Glue

► WAR COMMUNIQUES are not the only news items that come out of Africa nowadays. Here's a bird story as fantastic as anything that Sinbad the Sailor ever told, but new and backed by the solid scientific authentication of the British Council. The information was obtained by an English ornithologist, R. E. Moreau, working under the auspices of the Royal Society of London, in Kenya.

The palm swift, a graceful bird related to the American chimney swift, does not build a cup-shaped nest like other birds, and lay its eggs in the bottom. Its nest is a flat pad with a mere flange at its lower side, and it is stuck to the nearly vertical frond of a tall palm, so that it actually stands on edge.

It is made of the feathers of other birds, which the swift collects as they float through the air, darting after them as swifts and swallows generally dart after insects on the wing. It is made fast to its palm-leaf foundation by means

of a kind of natural glue secreted by the bird's salivary glands.

The eggs, laid only one or two for a sitting, are too big to be kept from rolling out by the narrow ledge at the bottom, so the bird glues them fast to the loose, fluffy surface feathers of the nest.

Because the nest is vertical, the parent birds cannot sit on the eggs. Taking turns at incubation, they grip the back of the nest with their feet, and hold themselves firmly against the eggs, with the head at a rigid, upward angle. For 20 days this has to be kept up, until the eggs hatch.

The young are not glued to the nest by the parents; they just have to hang on for dear life, but they are quite competent to do so. They do get a little support from the ledge at the bottom of the nest, and of course are held in place by the parents during brooding. They remain in (or rather up against) their precarious home until they are a month old, by which time they are able to fly.

Science News Letter, June 19, 1943

PSYCHOLOGY

Color-Blind Animals Have Equipment for Color Sight

► THE EQUIPMENT necessary for seeing colors is present in the eyes of many animals. But only the animals which needed to distinguish colors for their self-preservation have taken the trouble to discover how to use it, Dr. Gordon L. Walls of the Bausch and Lomb Optical Company reports (*Journal of Applied Physics*, April).

Colors send out light waves of different lengths. When these waves strike the rods and cones of our eyes, the impulse is relayed to the optic nerve, and the sensation produced makes us see red or blue, or whatever the color may be. The pinnacle in the evolution of color discrimination is the ability to identify varying shades of the same color. Monkeys, apes, and man are the only mammals which have the ability to see objects in color.

The mechanism for receiving the characteristic wave-lengths of various colors is present, Dr. Walls states, even in the eyes of animals which are known positively to have no color vision, such as a cat. Dr. Walls feels that many animals have only to differentiate between the nerve impulses which already exist and sort out the wave-lengths in order to see the world in color.

Science News Letter, June 19, 1943

MEDICINE

Vitamin Checks Growth Of Transplanted Cancers

► INOSITOL, the sugar-like compound which prevents baldness in mice and is generally considered one of the B vitamins, checks the growth of transplanted cancers in mice, Dr. D. Laszlo and Dr. C. Leuchtenberger, of Mount Sinai Hospital report (*Science*, June 4).

The degree to which the growth of the transplanted tumors is checked depends on the size of the dose of inositol. Inositol, the scientific investigators state, can be used as a standard of reference for testing other substances that may inhibit tumor growth.

Dr. Laszlo and Dr. Leuchtenberger are members of a research team which previously has reported that complete regression or disappearance of 19 out of 46 spontaneous breast tumors in mice followed treatment with pearled barley.

Science News Letter, June 19, 1943

MEDICINE

Citric Acid Found in Bones Helps Breakdown of Sugars

► CITRIC ACID, long known for the sour taste it gives to lemons and some other fruits, has been discovered in relatively large amounts in the hard material of the bones of the body and is believed to play a part in their rejuvenation, according to an announcement of the British Council.

Discovery of the acid in the bones was made by Dr. F. Dickens, of the Cancer Research Laboratory, Newcastle-upon-Tyne.

One possible use for this large store of citric acid may be as a reserve supply of an essential catalyst for breaking down sugars and starches, it appears from studies by Dr. H. A. Krebs, of Sheffield University.

Second use for the citric acid in bone, its possible role in bone rejuvenation, depends on the remarkable power the citrates have to dissolve the calcium phosphate and calcium carbonate in bone. It is known that the hard substance of bones is continually being dissolved away and replaced by fresh bone salts. Since the bone salts are practically insoluble in water, it is suggested that the citric acid or its salts help the rejuvenation process by making the bone salts more soluble and therefore more easily mobilized and transported by the blood for manufacture of new bone.

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