

## SCIENCE NEWS

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## SCIENCE IN 1943

*(Continued from issue of December 24)*

## MEDICAL SCIENCES

HOPE of a penicillin conquest of venereal disease was held out by reports of cures of syphilis and gonorrhea by this safe, potent chemical from molds which has also been reported effective in treatment of gas gangrene, osteomyelitis and other staphylococcal infections, empyema, pneumococcus pneumonia and hemolytic streptococcal infections.

A new drug for fighting malaria and one sufficiently promising to be worthy of trial under field conditions was announced by the War Department, though the name of the drug was not released.

"Continuous caudal analgesia," which banishes the pain of childbirth by means of continuous injection near the base of the spine of a pain-killing chemical, mety-caine, was announced and said to give promise of further surgical usefulness for war wounded.

Possibility of using chicken serum to develop vaccines to protect against, or antisera to cure, certain virus diseases, such as virus pneumonia, parrot fever, trachoma and lymphogranuloma venereum, was suggested by announcement of a chicken antiserum that definitely protected mice against a virus pneumonia.

Folic acid, one of the new B vitamins, was found to have an important role in blood cell production in studies showing it cured anemia and agranulocytosis induced by sulfonamides in white rats and that lack of it in the diet caused agranulocytosis in monkeys, anemia in chickens.

Thiamin, vitamin B<sub>1</sub>, was discovered to be manufactured by the intestinal bacteria of humans, a finding likely to change earlier views of vitamin requirements.

Two 24-hour sulfa drug cures for impetigo were announced, one using sulfadiazine in a jelly that gives a plastic coating and needs no bandage, the other using microcrystalline sulfathiazole.

A method of creating nerve banks, constituting a supply of quick frozen and dried nerve fragments for nerve grafts, was developed and found successful in laboratory animals with clinical use as a future possibility.

The first clinical use of nerve grafts from cadavers with acacia used to glue the graft in place was reported with good results in the first two cases.

The production of safe vaccines against two types of encephalitis, or sleeping sickness, the St. Louis and Japanese B types, effective, according to blood tests, in half or more of the vaccinated, was announced.

A specially treated cotton, oxidized cellulose, which is safely absorbed by the body, was found to aid in stopping bleeding during operations on the brain or elsewhere when the material was soaked in blood-clotting thrombin, and gave promise of further medical and surgical usefulness.

The use of plasma, sulfa drugs and other drugs and the technique of quick evacuation of wounded to advanced

surgical centers accounted for the return to active duty after hospitalization of 41 per cent. of United States Army war wounded, and 53 per cent. of Navy and Marine wounded.

The United States Army with the aid of vaccines won an almost 100 per cent. battle for its overseas troops in combatting diseases, of which the typhus victory is especially noteworthy.

A second, more potent weapon against disease germs, penatin, was discovered in the same mold which yields penicillin.

Chemical methods were developed for taking salt out of sea water and making it drinkable.

Large-scale production of penicillin, germ-fighting chemical remedy from mold, was started, aided by development of two more productive strains of the mold and use of fermentation as well as surface culture methods of growth.

As a current make-shift method, the utilization of gauze saturated with culture medium in which the mold was growing permitted the application of penicillin to open wounds.

A major factor in causing sterile marriages and stillbirths was traced to incompatibility of the parents with regard to a newly recognized blood factor, Rh, and a method of distinguishing couples who are doomed to childlessness from this cause from those who have a chance of having some normal babies was developed.

New triumphs reported for sulfa drugs included speedy recovery of shipyard eye (epidemic keratoconjunctivitis) by sulfathiazole desoxyephedrine treatment; controlling scarlet fever epidemics by sulfadiazine; and preventing epidemic diarrhea of the newborn and curing "babies' sore eyes" due to gonorrhea by succinyl-sulfathiazole.

A new sulfa drug, desoxyephedronium sulfathiazole, reported to bring prompt relief in colds and to shorten their duration, and the prevention of ear and sinus infections after a cold by a sulfadiazine spray were announced.

New sulfa drugs which were developed include phthalyl-sulfathiazole, for treatment of intestinal infections such as dysentery, and sulfamerazine, for pneumococcus pneumonia, meningitis, gonorrhea and streptococcus infections.

Two possible anti-influenza weapons suggested by tests on laboratory animals were inhalation of small concentrations of triethylene glycol vapor in air and inhalation of a globulin fraction of influenza immune horse serum.

New methods of nerve repair and grafting, so far used only in animals, which were developed were use of an artery cuff to guide the blind growth of fibers from cut nerves in nerve splicing and use of a sliding sleeve extension made out of a stump of the severed nerve for the same purpose.

Repair of skull injuries by plates of tantalum, rare metal which is strong, light weight, easily malleable, does not corrode, is not poisonous and does not cause foreign

body reaction, and use of tantalum wire for suturing nerves and tantalum foil wrappers to keep regenerating injured nerves free from scar tissue were reported.

Initial success of a new method of treating goiter by medicines instead of by surgical operation was announced using the medicines, thiourea and thiouracil, which have the unique property of inhibiting the function of the thyroid gland, actually, it is believed, preventing production of its powerful hormone.

A method which simplifies treatment of diabetics and gives better control of blood sugar was developed by mixing two forms of insulin, slow-acting protamine zinc insulin and rapid-acting regular insulin.

Banishing toothache due to exposed dentin, common cause of dental pain, and desensitizing sensitive areas in the filling of cavities were reported to have been achieved by a new sodium fluoride treatment.

Red blood cells, formerly a waste by-product in the large-scale production of blood plasma, were salvaged and used successfully in place of whole blood in the treatment of anemia and, when dried and powdered, to hasten wound healing.

The right of the U. S. Food, Drug and Cosmetic Administration to set standards of identity for enriched food was upheld by decision of the U. S. Supreme Court.

Treatment of burns with a new plaster cast method, which stops pain, rests and protects the burned part from further injury, prevents swelling and slowing of the blood circulation in the burned area, showed good results in clinical cases.

Innovations developed for aiding in skin grafting included refrigeration anesthesia of the area from which the skin is to be taken; use of a dye, sodium fluorescein, injected into a vein to indicate when the circulation has been established in the graft; and use of a chessboard pattern, sticky paper method to fix small bits of skin for grafting over a large area.

In the search for a morphine substitute without addiction property, relief of intractable pain in patients with inoperable cancer was obtained by three chemicals, known for short as M3, M4 and M7, developed following the lead of female sex hormone synthesis.

Fish juices as a substitute for water for shipwrecked men in lifeboats were found to maintain life for protracted periods without danger to health.

#### ARCHEOLOGY AND ANTHROPOLOGY

AN inscribed strip of bronze, indicating existence of a monarch who claimed the title "king of the world" 2500 years ago, was discovered in Palestine.

Complete human remains, 7,000 to 10,000 years old, were discovered near Abilene, Texas, in a man-made grave of undoubted antiquity.

Human bones estimated to be about 10,000 years old were found in California, thus furnishing a further clue to the appearance of the early North American Indian.

The discovery of a number of important pre-Inca sites in the Cuzco region of Peru was announced in the United States.

Further evidence of the relationship in pottery styles between the mainland of South America and the West Indies, denoting similar culture, was announced.

Records, made public in the United States, indicated that the first human inhabitants of the northern coast of Chile were two separate fishing populations followed by an agricultural culture.

#### AERONAUTICS

A SUPER-BOMBER, the B-29, which is superior to the B-17 and the B-24 in range, firepower and load, was reported in production.

The 70-ton Martin "Mars," world's largest flying boat, was turned over to the Navy after completion of the last of a series of grueling tests.

The Grumman "Hellcat," a Navy fighter plane which retains the heavier firepower, better armament and leak-proof gas tanks of the "Wildcat" and has increased range, speed, climb, maneuverability and altitude capacity, went into combat against the Jap "Zero."

Airplane anti-icers, which shoot hot air through ducts on wing and tail surfaces, were perfected and installed on long-range patrol bombers, it was announced.

Formation of ice on propeller blades was prevented by a strip of electrically conductive rubber on one edge of the blade.

Three super-aircraft carriers of 45,000 tons, capable of handling larger multi-engined planes, were authorized and the construction of one started.

A new 24-passenger, twin-engine airplane, considerably smaller than the familiar DC-3, having about half the power and costing half as much, was designed.

A new 8-ton Navy torpedo plane, "Seawolf," carrying a crew of three, was scheduled for quantity production.

Powerful rocket jets were reported used by the Germans as auxiliary power to assist heavily loaded planes in the take-off, and experiments are under way in this country.

"Cycleweld," a new process of putting together aluminum alloy, wooden or rubber aircraft parts without riveting or welding but by using a specially prepared cement and applying heat and pressure to the joint, was announced.

An automatic computing sight for aerial gunners was announced as standard equipment for all "Flying Fortresses."

The electronic autopilot, which keeps a heavy bomber rigidly on its course while approaching the target during high altitude precision bombing missions, was announced.

The flight-ray was developed to utilize a cathode-ray tube to read multiple flight instruments and warn the pilot when any instrument deviates from its setting.

A waterproof radio transmitter to SOS automatically over an approximate area of 100,000 square miles was developed for use in emergency rafts.

An airplane windshield that will not ice up and that will stop 15-pound birds collided with at 200 miles per hour was developed.