

METALLURGY

Silver-Magnesium Solder Withstands High Heat

► SILVER-MAGNESIUM solder that can withstand the temperatures within gas jet turbines was found in Germany by American investigators. It is a material that should have wide value in the United States.

In addition to its use in turbines, the solder can be used in the fabrication of stainless steel heat exchangers, exhaust manifolds, gas turbine parts and general chemical equipment where high heat is encountered.

The solder is made of 85% commercially pure silver and 15% magnesium. Addition of magnesium to pure silver in this proportion gives an alloy with excellent soldering properties, it is said, and does not lower the melting point of the silver. The solder has a melting point of 1790 degrees Fahrenheit, and retains its high strength up to 850 degrees Fahrenheit.

A report on the silver-magnesium solder with additional facts relative to it has been issued by the Office of Technical Services, U. S. Department of Commerce.

Science News Letter, August 31, 1946

GENERAL SCIENCE

Lightning Kills Science Talent Search Winner

► LIGHTNING, not war, was responsible for the first death among the 200 winners of the annual Science Talent Search, all highly selected boys and girls with proved talent for research.

John Taylor Hopkins IV, 18, of Washington, D. C., a 1946 winner in the fifth annual Science Talent Search, was fishing in Jacksonville, Fla., when lightning struck his steel rod and all efforts to revive him failed.

Of the 200 chosen in the first five Science Talent Searches, 146 have been boys. Of these 73 have been or are now in the armed services. Another 52 are still under draft age. Many of the 73 served on the fiercest fighting fronts in the European and Pacific theaters, and others hazarded their lives at sea and on land in service operations. Two are holders of the Purple Heart for disabling battle injuries.

But it was lightning, unconquered phenomenon of nature, that turned a gay fishing excursion into a death trip for John Hopkins. He graduated this

spring as valedictorian, attended George Washington University and planned to enter Johns Hopkins University this fall on a four-year full tuition scholarship to study organic chemistry.

Outstanding work with diazo dyes earned Hopkins the honor of being chosen one of the 40 winners from 16,000 contestants in the Science Talent Search, sponsored annually by Science Service, and brought him a Westinghouse Science Scholarship.

Science News Letter, August 31, 1946

AGRICULTURE

Australian Beetle Aids In War on Weeds

► INSECTS that devour plants are not always man's enemies. One Australian beetle promises to become a useful ally to man in California because it eats only a certain kind of weed, known as the Klamath weed.

Success with imported stocks of the weed-eating beetle is reported by James K. Holloway, U. S. Department of Agriculture entomologist, who works in collaboration with the University of California experiment station. The beetle's usefulness, he explains, is due to the fact that the weed it feeds on, known elsewhere as St. John's wort, has no near relatives among crop or pasture plants.

About 100,000 acres of California lands are infested with the Klamath weed, and the helpful little beetles from Australia are being propagated as rapidly as possible so that they may be released in the fields.

Science News Letter, August 31, 1946

PHYSICS

Bikini Radioactivity Traced in California

► A FAINT radioactive echo of the Bikini blast was recorded on a sensitive electroscope at the University of California at Los Angeles on July 4, four days after the explosion. This has just been announced by Dr. Clifford Garner, who spent three years at the Los Alamos laboratory during the war.

This record at Los Angeles checks with an earlier report from San Francisco, where Geiger counters clicked slightly faster on July 4.

Air-borne radioactivity so far from the scene of the explosion was, of course, not at all dangerous.

Science News Letter, August 31, 1946

IN SCIENCE

CHEMISTRY

Buttermilk Gave Clue to New Fire Extinguisher

► MAGNESIUM fires, easily started and hard to stop, can be put out with a new powder that owes its discovery to a glass of buttermilk.

The fire extinguisher looks like a large salt-shaker. The powder, to be shaken on the fire, is composed of eight parts talc, two parts casein powder and one part magnesium carbonate, added to keep it from absorbing moisture.

Dogged by the problem of keeping magnesium fires to a minimum, as he lunched one day, a safety engineer at Northrop Aircraft, Inc., remembered he had heard that buttermilk would put out fires. So instead of drinking his buttermilk, he experimented and found that it did retard the fire's progress. Chemists traced the fire extinguishing power of the buttermilk to casein, and mixed the talc and magnesium carbonate with it to facilitate pouring.

Science News Letter, August 31, 1946

PSYCHIATRY

More Psychiatrists Needed To Combat Mental Illness

► WARNING that 8,000,000 Americans are suffering from some form of mental or nervous illness, the U. S. Public Health Service at the opening meeting of the National Advisory Mental Health Council in Washington, D. C., appealed for more trained personnel, more research and demonstration projects and improved community mental health programs.

The Public Health Service estimated that 10,000,000 Americans in the current population will require hospitalization for mental illness sometime during their lives. At least four times the present number of psychiatrists are needed, with more funds for research and more community all-purpose mental clinics, the agency said.

The two-day meeting was the first for the council, set up under the National Mental Health Act. Other provisions of the act call for a National Institute of Mental Health and grants-in-aid for research and training.

Science News Letter, August 31, 1946

E FIELDS

HERPETOLOGY

Unhatched Turtles Show "Grown-Up" Reactions

► UNHATCHED young loggerhead turtles, taken out of their shells two weeks or more before normal time for emergence, show many of the same reactions that grown-up turtles have—swimming and crawling movements, snapping, righting themselves when overturned, and the persistent tendency to crawl seaward common to aquatic turtles.

These are among the results of a study of embryo turtle behavior made on the Florida coast by Dr. Karl U. Smith of the University of Wisconsin and Dr. Robert S. Daniel of the University of Missouri. They report on their work in *Science* (Aug. 16).

The two scientists took 55 eggs of loggerhead turtles and opened them at various intervals during their incubation period of from 45 to 50 days.

First movement of the embryo turtle was observed on the twelfth day. The animals, at this stage still shell-less and lizard-like in shape, merely bend their bodies when touched. They become able to move their legs independently about the eighteenth day, and give eyelid and mouth reactions at 22 days.

Science News Letter, August 31, 1946

CHEMISTRY

New Process Extracts Peanut Proteins

► TWO NEW forms of protein, good for making synthetic fabrics, adhesives and other manufactured products, can be extracted from peanut meal left after oil extraction by a newly patented process developed at the U. S. Department of Agriculture's Southern Regional Research Laboratory in New Orleans. Previous methods of extraction have brought out all the proteins at once, and they have had to be separated into fractions good for different purposes—which of course involved additional chemical treatment and consequently greater cost.

In the new process, the meal is first treated with water containing caustic soda, with its hydrogen ion potential adjusted close to the neutral point.

This brings about a total extraction of proteins. The remaining solids are centrifuged out.

Acid is added to the remaining clear liquid until the hydrogen ion potential is 6. At this point a white, semi-plastic precipitate is formed that can be pulled into filaments, ribbons or sheets showing a marked sheen or gloss. It has been named "protein 6." To the remaining clear liquid more acid is added until the hydrogen ion potential is 4.5. This brings out a second white solid, which is granular and non-sticky. This has been designated "protein 4.5."

The four-man team conducting this research, consisting of G. W. Irving, Jr., A. L. Merrifield, R. S. Burnett and E. D. Parker, has assigned rights in the patent, No. 2,405,830, royalty-free to the government.

Science News Letter, August 31, 1946

PUBLIC HEALTH

Soil Disposes of Penicillin Waste

► PENICILLIN, conqueror of many diseases, indirectly imposes a public-health problem on the communities where it is produced, which bacteriologists at Rutgers University have been working to solve.

The problem comes from the large quantities of left-over nutrient solution on which the penicillin-producing mold has been raised. It contains a mixture of sugars, plus amyl acetate and other solvent chemicals. Poured raw into the rivers, it would constitute an exceedingly nasty kind of stream pollution, which would provoke no end of protests, and probably restrictive legislation as well.

The soil, from which penicillin originally came, has provided the answer. Dr. Willem Rudolfs and his co-workers made a mixed culture of microbes from a teaspoonful of soil, subcultures from which are able to use up the last bits of nutrient material in the waste fluid and return clean water to the streams.

Two different processes have proved successful. One can be carried on without air, in big steel tanks like ordinary oil storage tanks. The other requires air, which is bubbled through the solution in long rectangular concrete tanks.

The outflow liquid from either type of tank is seeped through sand beds, where other billions of bacteria continue to work on it, until nothing is left but water, ready to go back into circulation.

Science News Letter, August 31, 1946

ELECTRONICS

Cesium Metal Vapor Makes "Talking Lamp"

► CESIUM METAL vapor allows an electric lamp to talk. Such a lamp developed by Westinghouse is used to emit invisible infra-red rays over which conversation can be transmitted from an instrument known as a photophone.

Infra-red communication systems were used by both Germans and Japs during the war for distances up to ten miles where wires could not easily be stretched and radio would be a give-away. According to reports, however, they did not use cesium, sometimes spelled caesium.

The advantage of cesium, a metal of the sodium, potassium, lithium, rubidium group together known as the alkali metals, is that it is an efficient generator of infra-red waves, also a poor visible illuminant. Its low visibility minimizes requirements for a filter to block out stray visible light which would betray the presence of the signal system.

The cesium vapor lamp was designed by Dr. Norman C. Beese, Westinghouse research engineer, at the request of the U. S. Navy, but the device was not ready for use when the war closed.

Science News Letter, August 31, 1946

MEDICINE

Dual Treatment Advised For Dementia Paralytica

► ADVANCED cases of syphilis accompanied by psychotic symptoms can now best be treated by giving the patients penicillin as well as infecting them with malaria fever, three Johns Hopkins Hospital physicians, Drs. Frank W. Reynolds, Charles F. Mohr, and Joseph Earle Moore, advise in a report to the *Journal of the American Medical Association* (Aug. 17).

During two years 41 patients with dementia paralytica were treated with penicillin, 24 with the drug alone and 17 with penicillin administered at the same time as induced tertian malaria. There was 58% improvement for those dually treated as compared with 46% for the others.

The doctors conclude:

"The effectiveness of current penicillin-malaria therapy is such as to make it, for the present at least, the treatment of choice for patients with dementia paralytica."

Science News Letter, August 31, 1946