

tivity of the "brain waves" only at specific points of the brain.

How the radar maps of brain and heart are made was described by Dr. Stanford Goldman of Syracuse University at the meeting in New York of the Institute of Radio Engineers. Dr. Goldman was formerly research associate at Massachusetts Institute of Technology where the equipment for radar mapping of brain and heart was first developed.

"Results already obtained," Dr. Goldman said, "indicate that the pictures will be use-

ful for the diagnosis of disease in the heart and brain and in studying the physiology of these organs."

The equipment picks up the tiny electrical impulses which accompany the action of both heart and brain and converts them into a constantly moving map-like picture similar to those made by World War II radar sets. The "pick-ups" are nothing more than small wires held against the skin with adhesive tape. The patient feels nothing, not even a needle prick.

Science News Letter, March 25, 1950

PHYSICS

Californium Element 98

► CREATION of the 98th and heaviest chemical element through atomic bombardment in the University of California 60-inch cyclotron has been made known.

It has been christened californium, honoring the university and state where the six heaviest trans-uranium elements, including plutonium, have been manufactured and discovered in the past decade.

Production of minute and fast-disappearing quantities of the new element 98 follows close upon the announcement of element 97 last January.

The team of scientists engaged in Atomic Energy Commission research which produced californium included Dr. Stanley G. Thompson, Kenneth Street, Jr., Albert Ghiorso, and Dr. Glenn T. Seaborg, with Dr. Joseph G. Hamilton making the bombardments with alpha particles of the isotope 242 of curium which was transmuted into the new element.

Living only a short time before it decays by emitting an alpha particle half of an

amount of californium will disappear in 45 minutes.

The amount of californium so far made is infinitesimally small, since the bombarded curium, itself very rare, weighed only a few millionths of a gram. The identification of the new element was based on its chemical separation and its predicted half-life.

No use for the new element is suggested, except that it adds a chemical building block to the universe. It cannot be used for bombs or power.

Californium has a place in the actinide series of elements that corresponds to dysprosium, element 66, in the lanthanide series. It has been customary to name the members of the two series in a similar way. Dysprosium means "hard to get", so Dr. Seaborg, leader of the element-discovering group, explains that California was hard to get to about a century ago in the gold rush days.

Element 97 was named berkelium, in honor of the city of Berkeley.

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PHYSICS

Missile's Speed in Water

See Front Cover

► COULD a missile such as a torpedo travel at supersonic speeds through water? The Navy is trying to find out.

Naval ordnance experts revealed they have fired small steel balls into water at speeds up to 7,000 feet per second (more than 4,770 miles per hour). Sound in cold water travels approximately 5,000 feet per second, nearly five times as fast as in air.

Shown on this week's cover of SCIENCE NEWS LETTER is a picture of what happens to a small steel pellet, moving along at 6870 feet per second, more than 4500 miles an hour, when it strikes the water.

This photograph is actually a shadowgram of the entry into water of a one-eighth inch steel sphere. It shows the straight shock waves in the air, and the semicircular shock waves in the water

stirred up by such high speeds. The central cavity and the splash created when the sphere entered the water can be seen, but the sphere itself is hidden behind the shock front at the lower end of the cavity.

The Navy's pellets slow down fast. A decelerating force 2,000,000 times the force of gravity has been tabulated, Dr. J. Howard McMillan of the Naval Ordnance Laboratory in White Oak, Md., indicated. Scientists call the force of gravity "g". When a diving plane pulls out sharply, pilots sometimes experience a force nine or 10 times the force of gravity.

At White Oak the Navy has opened a new laboratory devoted to scientific destruction of its own weapons.

More than 500 top scientists and military leaders were invited to see the new \$4,000,000 installation. From submarines to gun projectiles, naval weapons will

be strained and battered under exaggerated field conditions. Savings in government development work in millions of dollars are expected.

A giant pressure tank will be able to subject midget submarines to half-mile-deep pressures. High speed movie cameras will record what happens to tiny models of torpedos, mines and depth charges when they enter the water at tremendous speeds. An air gun 100 feet long can simulate the impact of a torpedo striking a ship or the jolt on a fuse fired from a gun.

Under Secretary of the Navy Dan A. Kimball dedicated the new Ordnance Environmental Laboratory on March 23. It was part of a two-day Armed Forces National Shock and Vibration Symposium in Washington.

Science News Letter, March 25, 1950

CHEMICAL ENGINEERING

Waves Remove Fine Dust, Chemical Mists from Gases

► PURE air and pure water received the attention of the American Institute of Chemical Engineers in Houston, Texas. Air and gas purification and waste disposal to prevent water pollution were number one subjects on the program.

Sonic dust and mist collection was discussed by Harold W. Danser, Jr., Ultrasonic Corporation, Cambridge, Mass. Fine particles suspended in a gas are caused to vibrate, collide, adhere and agglomerate together as the gas travels for a few seconds through a vessel in which is created a sonic field of high intensity.

The sonic field contains sound waves of the type too high in pitch to be recognized as sound by the human ear. These so-called ultrasonic waves are now being used for many purposes ranging from killing bacteria in milk to cleaning clothes.

Sonic agglomeration, he said, permits the collection of fine particles whose mass is otherwise too light to permit their ready collection by customary cyclones or separators used in removing larger, heavier particles from gas.

Sonic collectors were described which have been used successfully for the recovery of sulfuric acid fog, carbon black and oil mist.

Equipment for generating ultrasonics was described by W. H. Janssen, General Electric, Schenectady, N. Y. Even though the art of generating ultrasonic energy is not new, developments stimulated by World War II have resulted in increased activity in the field, he stated.

Pollution abatement and industrial water management was the subject of discussion of C. F. Hauck, Hall Laboratories, Pittsburgh, Pa. For lowest total water costs, industrial waste problems must be studied with full consideration for the many interrelationships among problems of water procurement, usage and disposal.

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