

RADIO

**Radio-Noise Filters
For Use in Aircraft**

► COMPACT, LIGHTWEIGHT, radio-noise filters, developed for use in aerial navigation, were described at the meeting of the American Institute of Electrical Engineers in Cleveland, Ohio, by C. W. Frick and S. W. Zimmerman of the General Electric Company.

The filters give excellent noise suppression, especially from 200 to 20,000 kilocycles, mounted in any position and operating over a wide temperature range. The new filters comply with U. S. Army Air Forces specifications, including the requirements for vibration and acceleration.

"Careful planning is necessary to get the fullest use from both power and radio equipment, and not overburden the aircraft with attachments solely to make the radio work," the engineers stated. As electricity is used for engine ignition, lighting, and many other purposes as well as for radio, the probability of interference with radio reception is high. These filters help provide the high-fidelity radio reception necessary in aerial warfare.

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GEOLOGY

**Geologists Aid Army in
Locating Water Supplies**

► MOST IMPORTANT MINERAL resource in this war is not iron ore for steel production, bauxite for aluminum or sulfur for explosives. By far the most important mineral is water: water, for the drinking, cooking and washing needs of armed men and war workers; water, for the thousand industrial processes that turn out the weapons and munitions of war.

New water sources by the hundreds have to be found for Army camps, for new war-industries sites, for the mushrooming towns that spring up around them. Finding them has been the job of the nation's geologists, states Dr. O. E. Meinzer of the U. S. Geological Survey. The work has been done by field men of the Survey itself, by the various state geological surveys, by geologists in the Army Engineer Corps, in universities and in private practice.

In 1942 alone, the U. S. Geological Survey made reports on groundwater at about 900 places for Army and Navy establishments and for war industries,

reports Dr. Meinzer in *Economic Geology* (June-July). Ten geologists from the Survey have already been commissioned as Engineer officers and detailed to the search for water. One of them, Maj. R. C. Cady, has already died in service overseas as a result of accidental injuries. Some of the remaining nine have already rendered great assistance in locating water in North Africa, where it is always critically needed; the others are serving in water supply battalions in this country.

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CHEMISTRY

**Girls Assisting in
Research on War Gases**

► DANGEROUS GASES, corrosive chemicals and deadly liquids are handled daily by a group of girls, most of them hardly out of their teens.

Working without the glamour of military uniform, clothed in laboratory coats, with faces protected by transparent masks, often wearing grotesque gas masks and thick rubber gloves, this scientific group works long hours at the Chemical Warfare Service Laboratory at the famous Massachusetts Institute of Technology. These girls are helping to develop new methods of chemical defense and offense, an important part of the War Department's scientific warfare. Many of these girls recruited from local schools and colleges are filling scientific and technical jobs that traditionally have been held by men.

War Department officials, in announcing the important services of these feminine scientists, praised also their "ability to say nothing about their work when off the job." Like other soldiers, they keep their mouths shut about what they are doing to help win the war.

Titration, weighing, distilling, and carrying out new chemical processes, these girls help rush experiments to meet any eventualities of chemical warfare. Others in the group build optical instruments, operate testing machines and construct delicate apparatus that can be seen only through the use of a microscope. The Chemical Warfare Service's feminine scientists are always alert to the danger of breaking flasks and spilling acids. Chemical Warfare Service officials state that the girls accept the hazards of their jobs as their part in the war effort and do not balk at working with dangerous gases, deadly liquids, and penetrating acid compounds.

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IN SCIEN

INVENTION

**Harvester for Sea Moss
Awarded U. S. Patent**

► ONE OF the oddest harvesting machines ever devised is protected by patent 2,320,283, obtained by three Massachusetts inventors, E. R. Knowlton of Rockport, G. F. Doucette of Gloucester and J. W. Eager of Fitchburg. It is intended to operate on the sea bottom and its harvest is to be sea moss. Sea moss, or carrageen, is a low-growing, bunchy kind of seaweed, valued for certain medicinal and food uses. It is usually pulled up with long-handled, rake-like implements; but this treatment hurts its market value by tearing the bunches. The three inventors have devised a rotating circular cutting device that will detach the growth with a minimum of tearing. This operates in conjunction with a suction pipe that brings them up to the harvesting barge.

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GEOLOGY

**Fossil Specimen Similar
To Ferns Growing Today**

► A HUNDRED - MILLION - year - old fossil specimen of a genus of ferns that still live in marshy woods of the eastern United States, that thrived when dinosaurs still roamed the earth, has been discovered in a Wyoming shale deposit, and is given scientific description in the *Journal of the Washington Academy of Sciences* by Dr. Roland W. Brown of the U. S. Geological Survey.

The plant is one of the very few members of the fern group that is a vine. Its thin, wiry stems clamber in masses over shrubs and brush heaps the woods today, and presumably also in remote Cretaceous times when it grew in the West. Leaves of both living and fossil species are shaped like little hands; the extinct species having about four fingers, the living one as many as seven.

Dr. Brown has given his newly discovered fossil fern the scientific name *Lygodium pumilum*.

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CE FIELDS

PHYSICS

Divergent Beam Used In Taking X-Ray Photographs

A DIVERGENT BEAM has successfully been used in taking X-ray photographs of crystals. This method promises to be extremely useful in studying the arrangement of atoms in the crystal. As a short exposure is required, it will aid particularly in research with short-lived crystals.

This new development in X-ray photography, reported by the British Council, was made at the Royal Institution, London, by Dr. Kathleen Lonsdale with a tube designed by Dr. A. Muller.

When the planes of atoms in a single crystal reflect a fine X-ray beam, the reflected beams photograph as sharp black spots on a light background. Substituting a divergent beam for the usual cylindrical pencil, the background becomes darker and the former spots open out into curves.

Besides the reflection curves, which are black, the photograph shows "deficiency" curves. These lines are lighter than the general background because radiation in certain directions has been removed from the original beam.

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AERONAUTICS

Wind Holds Important Roles In Launching Planes at Sea

► WIND has become an important factor in naval warfare, as it was in the days of sailing ships though for a different reason, Lt. Comdr. William C. Chambliss, U.S.N.R., points out (*U. S. Naval Institute Proceedings*, May).

In the old days, admirals maneuvered their fleets to the windward of their enemy if they could, because this "weather gage" gave them greater freedom of movement when the moment came to close battle. Now the situation is reversed: it is better to be to the leeward of the enemy because a direct head wind helps greatly in getting planes launched from, and landed on, the flight deck of an airplane carrier.

The most exasperating thing that can happen to a carrier, Comdr. Chambliss points out, is to have a light wind dead astern. The fleet may advance to meet the enemy, but when the time comes to launch the planes the carrier has to turn around and run away from the scene of impending battle just as fast as she can go, until her planes are up. By that time she may be almost back to where she started from.

That this is not at all an imaginary situation, Comdr. Chambliss shows by a most crucial example. In the Solomons, our ships must steam toward the northwest to find and fight the Japs. The wind in that region blows almost incessantly from the southeast. This favors Japanese carriers and handicaps our own.

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ENGINEERING

Navy Getting "Dieselized" Under Pressure of War

► THE U. S. NAVY, under pressure of war, is undergoing a "revolutionary process of dieselization," Capt. Lisle F. Small declared before the meeting of the Society of Automotive Engineers in Cleveland.

At the end of World War I, he said, the Navy had diesel engines only in submarines, and the total horsepower of all of them was only 150,000. Now, diesels are "chunging" away to the total tune of 12,000,000 horsepower, on craft of all kinds ranging from the mighty 45,000-ton Iowa down to the humblest tugboat.

There has been a progressive slimming down of pounds per horsepower, as new types of diesels evolved, Capt. Small told his audience. In 1918, the engines of most of our submarines weighed 66.5 pounds per horsepower. The big diesels in the German pocket battleship Von Spee, destroyed by her own commander in the mouth of the Plate river early in the war, had got the weight down to 28 pounds per horsepower.

Among the factors that have made for success in American use of diesel engines, Capt. Small attributed much importance to two: the familiarity of most American boys with internal engines through their everlasting tinkering with automobiles, and the far-sightedness of several of the diesel construction firms in establishing special schools for the training of diesel operators and service men.

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MEDICINE

National Cancer Institute Director Is Retiring

► RETIREMENT of Dr. Carl Voegtlin as director of the National Cancer Institute, U. S. Public Health Service was announced at the meeting of the National Cancer Advisory Council.

Dr. Voegtlin, who has been director of the Institute since its founding in 1938, is retiring because of age. He will be 64 next July 28. At the Council meeting he was presented with a portrait of himself.

Before taking over as director of the National Cancer Institute, Dr. Voegtlin had been chief of the division of pharmacology in the National Institute of Health. He came to that division of the U. S. Public Health Service in 1913 from Johns Hopkins Medical School, where he had been associate professor of pharmacology.

Born in Switzerland and educated in the Universities of Basel, Munich, Geneva and Frieberg, Dr. Voegtlin has had a distinguished career, and an international reputation for his researches in physiology, pharmacology and cancer.

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PSYCHOLOGY

Problem, Normal Children Reason About the Same Way

► PROBLEM CHILDREN and normal children reason in just about the same way, a study of 606 seven- to nine-year-olds showed Dr. Myrtle Luneau Pignatelli of New York University's School of Education. So when Johnnie becomes unmanageable, it can't be blamed on the way he thinks. (*Genetic Psychology Monographs*).

Dr. Pignatelli matched the problem children she studied with children of normal behavior having the same average chronological age, mental age and I.Q. The 1916 Stanford-Binet Intelligence Test was used in examining both groups.

Problem children tend to be just a little better on the use of language in description, she found; normal children are a little better in memory span and vocabulary. But the differences are so small as to be insignificant.

A child's mental development, Dr. Pignatelli concluded, is like his physical growth. It is not susceptible to the vicissitudes which come with failure to make social and emotional adjustments.

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