

## PUBLIC HEALTH

**Case Reports Indicate Flu Epidemic Waning**

► THE INFLUENZA epidemic is waning, it appears from the number of cases reported to the U. S. Public Health Service. From a high of 134,962 cases the week ending Dec. 15, the figure dropped to 42,552 the week ending Dec. 22, latest for which figures are available.

The figures are not strictly comparable, since the one for Dec. 22 represents reports from only 43 states and the District of Columbia, but it is believed that when all states have reported, the total will still be considerably below the previous week's. More than half of the cases reported Dec. 15 were from one state, Kentucky. For that week Kentucky reported 89,363 cases, but only 6,816 for the week ending Dec. 22.

If the current epidemic follows the pattern of the 1943-44 one, it will be pretty well over in another week or two. Cases that year reached the highest figures the weeks ending Jan. 1 and Jan. 8 and then declined.

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## CHEMISTRY

**Sorting Machine Isolates Uranium 235 in Vacuum**

► A SECRET piece of equipment with a meaningless but adequate designation, a "Calutron," is an electrical sorting machine that hurls invisible atoms into a vacuum chamber and groups them according to weight. It was used in the isolation of uranium 235, the chain reaction metal used in atomic bombs, it is now revealed.

These pieces of equipment were constructed by the Westinghouse Electric Corporation after their development by University of California scientists and Westinghouse engineers. None of the 800 workers who made various parts knew what the completed machine was to be. After completion the machines were shipped to the atomic bomb plant at Oak Ridge, Tenn.

"The Calutron is able to sort atoms because of atomic weight variances," Dr. L. W. Chubb of Westinghouse explains. "First, uranium is introduced into the machine in volatile form and strikes an arc of electricity, discharged into a vacuum. This breaks it down into atoms and tags each atom with an electrical charge. A magnetic field in the tank causes the ionized uranium atoms to move in circular paths.

"Uranium 235 atoms, being slightly lighter than other atoms of uranium, move in a slightly smaller radius," he continues, "and separate receiver boxes can be placed at appropriate places to catch atoms of each kind."

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## CHEMISTRY

**"Fog Generator" Used for Application of DDT Spray**

► DDT in the minute droplets of artificial oil fogs promises to be one of the most useful and economical ways of applying this new insect poison for the protection of orchards, vineyards and woodlands. It was first tried out during the war with a Navy "fog generator", at that time a secret weapon for the production of a concealing white mist of ultra-fine oil drops. The droplets thus dispersed proved to be even finer than needed, for the fog rose higher than the plants to be sprayed. However, the test was successful in leaving microscopically fine crystals of DDT well distributed on the vegetation after the mist had cleared and the deposited oil droplets had evaporated.

Now a specially designed "fog sprayer" has been built for agricultural work by the Todd Shipbuilding Corporation, constructors of the original Navy oil-fog machine. The new apparatus has a different appearance but works on the same principle. Its mist of oil drops clears more quickly than the Navy's oil fog, but distributes the DDT in even more effective fashion.

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## PHYSICS

**Vacuum Tube With Built-in Microphone**

► A VACUUM tube with a microphone diaphragm sealed directly into its side wall is the novel invention on which Jerome Rothstein of Belmar, N. J., has received patent 2,389,935. Among possible users for a tube of this type which the inventor lists are detecting minute sound and mechanical vibrations; measuring changes in barometric pressure, temperature, turbulence, altitude, wind pressure and wind velocity; gauging depths of submergence in a liquid and measuring the elastic properties of solids. It is claimed to be especially useful in remote-control and remote-recording setups. Patent rights are assigned, royalty-free, to the government.

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**IN SCIENCE**

## GENERAL SCIENCE

**Fellowships for Science Veterans Still Available**

► SPECIAL fellowships established by the National Research Council to enable young scientists whose graduate studies were interrupted by the war to resume their work toward the doctorate are still available, but applications must be in by Feb. 1.

The fellowships were made possible by a grant of \$335,000 from the Rockefeller Foundation, to help close up the war-caused gaps in the ranks of American research workers with minimum loss of time. Prospective graduate students are urged to get their applications in at once, even though they may not be able to resume their studies until later.

Successful applicants will be given \$1200 a year for single persons and \$1800 for married men, with an additional allowance up to \$500 a year for tuition fees. Fellowships granted to individuals who are eligible for educational support under the G.I. Bill of Rights will be limited to the amounts necessary to give the standard fellowship.

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## ORNITHOLOGY

**Two Pairs of Quetzals At Zoo in Washington**

► TWO PAIRS of quetzals, sacred birds of the ancient Mexican and Central American peoples, have arrived at the National Zoological Park in Washington, D. C., Director William M. Mann stated. They were brought from Costa Rica, in Central America.

The quetzal is a bird about the size of a dove, with brilliant green-gold upper plumage, that shimmers blue when the sun strikes it. When fully grown it trails two tail-plumes three feet long. The new specimens are young birds with eight-inch tails.

Once widely distributed in the American tropics, the quetzal has been so persecuted by plume hunters that it is extinct over considerable parts of its former range. It used to be considered impossible to bring out living specimens, but in recent years this has been successfully accomplished with a few birds.

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# CE FIELDS

## PHYSICS

### "Spurious Echo" in Radar Was Caused by Birds

► RADAR pickups of flying birds, often made and correctly interpreted by both British and American observers during the war, were also made by German radar operators, but the Nazis never guessed what caused what they termed *Scheinziele*, or "spurious echoes." A German document on the subject has been turned up by British investigators, and is briefly summarized in the scientific journal, *Nature*, by H. A. C. McKay of the Admiralty's Miscellaneous Weapon Development Department.

The Germans noted that these "spurious echoes" came with especial frequency from the wide mouths of rivers, which of course is just where one might expect to get radar reflections from flocks of geese, ducks and other waterfowl. The document as printed gives them the improbably high speed of 600 kilometers (372 miles) an hour; Mr. McKay is inclined to regard this as a misprint for 60 kilometers (37.2) miles an hour.

How the Nazi radar experts must have groped foggily for an explanation is evidenced by one passage: "The physical origin of spurious echoes is so far unexplained. It is probably a matter of sharply bounded layers of discontinuity in the atmosphere. Charges, cloud movements, aerial vortices, as well as the boundary region between two layers of air can be suggested as possibilities."

They even planned a program of research, to locate such "discontinuities" in the atmosphere.

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## AERONAUTICS

### Pilotless B-17 Bombers Blasted U-Boat Bases

► "WAR WEARY" planes, aircraft that were flyable but unfit for combat because of age or condition, were used, pilotless, to destroy German submarine pens on the coast of Europe, it is now revealed. Loaded to capacity with dynamite, and directed by radio, radar and television, they hurled themselves at very low-level directly against U-boat bases.

B-17 bombers were used for the pur-

pose. Each carried 11 tons of Torpex, a high explosive many times more powerful than TNT. They were taken aloft by pilots and co-pilots who at 10,000 feet bailed out over Britain. Control of each bomber was then taken over by a "mother" plane, another B-17, whose pilot used radio to guide the giant bomber, radar to keep in touch with it through overcast and to search for unseen obstacles in its path, and television to aid in aiming the "baby" at the target.

Approach to the target was usually made at an altitude of 200 to 300 feet, to heighten the blast effect and cut down the accuracy of enemy fighter and flak opposition. The "mother" ship generally remained within five miles of its "baby", although it could guide it from a greater distance.

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## CHEMISTRY

### Germans Had Superior Air Purification Methods

► AIR PURIFICATION devices developed in Germany for use in submarines, especially in the one- and two-man U-boats, appear to be well ahead of Western Allied developments, according to American official investigators who visited Germany under the sponsorship of the United States government.

Development work by the Draegerwerk (Draeger factory), at Luebeck was investigated particularly, and especially work on air purification devices for underwater craft and for high-altitude demand regulators. An official report has been prepared, copies of which may be obtained from the Office of the Publication Board, U. S. Department of Commerce.

The Draegerwerk, well known for its production of precision instruments, was concerned with high-altitude oxygen breathing apparatus; submarine escape apparatus; diving apparatus; gas masks; oxygen cutting and welding apparatus; mine safety devices; swimming vests for pilots; rubber, surgical and technical goods, and other essential products. The report discusses them all.

Air purification devices for one- and two-man U-boats are important items. A less bulky system is required than ordinary equipment incorporating a fan and motor. This is particularly true in craft designed on the torpedo principle. The system developed at this plant was later used in German midget submarines.

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## METEOROLOGY

### Light, Powerful Magnet Made from Iron Oxide Ore

► A NEW TYPE of small, light, but powerful magnet made of iron rust and cobalt oxide has been developed by the General Electric Company, it is now revealed. It has been used in highly sensitive aircraft meters and in other wartime devices, and now will be available for general civilian uses. It is claimed to be the lightest magnet ever developed.

Actually, it is not made with the familiar rust seen on unprotected iron implements, but from an iron oxide ore in which the oxide is chemically the same as iron rust. The iron oxide and the cobalt oxide, both in powder form, are mixed in the proper proportion and formed into a solid by the process known as powder metallurgy. This means that the mixed powders are placed in a mold and sintered, that is, heat treated at a temperature well below fusion point.

The new type of magnet is a non-conductor of electricity and is not easily demagnetized. It thus may be used in high-frequency magnetic fields with little eddy current loss, it is claimed.

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## CHEMISTRY

### Non-Petroleum Motor Oil Flows in Zero Weather

► A NON-PETROLEUM war-tested motor oil for automobiles and aircraft engines will be on the market in limited areas this winter. The new product flows freely at 30 degrees below zero Fahrenheit, does not thin out at high temperatures, and provides efficient lubrication of the moving parts when the engine is running, it is claimed.

This engine lubricant will be known as Prestone motor oil. It is produced by Carbide and Carbon Chemicals Corporation, a unit of Union Carbide and Carbon Corporation. It was developed by research chemists of the producer, the research beginning in the early 1930's. It is a chemically created oil that resembles ordinary motor oil.

The new product will clean motors which have been gummed and sludged by ordinary oils, it is claimed. It is wax-free. It is characterized by low change of viscosity with changes of temperature, and can be used the year around without change of grade. However, excessive gasoline dilution and accumulation of dirt make oil change necessary.

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