

## ELECTRONICS

# Cause Radio Disturbances

Speeding clouds from the sun have been discovered by a new method of observation that promises important developments in radio theory.

► SPEEDING CLOUDS of electrically charged gases racing from the sun into the upper layer of the earth's atmosphere have been discovered by a new method of observation that promises important developments in radio theory, H. W. Wells, J. W. Watts, and D. E. George, Carnegie Institution of Washington staff members, reported.

The clouds from the sun were discovered during the magnetic-ionospheric storms of March 25 and 26 by investigators at the Ionospheric Laboratory near Kensington, Md., using a pulse-ranging method.

The discovery indicates that ultraviolet light coming from the sun is not the only means of producing the ionized layers of air whose height and density above the earth are fundamental considerations in radio theory.

During the magnetic storms, the Car-

negie Institution scientists said, the clouds of charged, or ionized matter, rush to the ionosphere, moving in from long to short range and out again in intervals of a few minutes. They come into the range of detecting instruments at heights of 500 to 600 miles above the earth at a speed of about one mile a second until they fuse with the layer of ionized air about 180 to 250 miles above the earth. Occasionally they appear to break away from that layer and move out again at about the same rate.

During these periods there are marked fluctuations in the ionosphere, and radio signals fade or disappear.

The scientists who discovered the clouds say that they are caused by a bombardment of earth's atmosphere by irregular bursts of electrically charged corpuscles, which may be likened to streams of dust from the sun.

Not to be confused with cosmic rays, these dust-like streams probably originate in or near the sunspots that are generally known to affect radio conditions.

When the clouds rush into the ionosphere, they cause sudden changes in the so-called F-layer, which will normally bounce radio waves back to the earth to permit long-distance broadcasting.

The distance that broadcasts can be heard is changed by the tendency of the newly discovered clouds to pull this reflecting layer away from the earth and then push it back. As the clouds penetrate deeper into the lower levels of the ionosphere, additional ionization causes broadcast radio waves to be absorbed instead of reflected.

Thus, when the sun bombards the upper layers of the earth's atmosphere with these high-speed clouds, radio broadcasts may be sent different distances than normally or lost altogether.

The instrument used in discovering these high-flying, radio storm clouds is a panoramic ionospheric recorder that sends out strong pulses of radiation into the upper atmosphere at adjustable intervals of 5 to 30 seconds.

A motion picture camera records the images registered on a cathode ray tube as the pulses are reflected from high above the earth in the ionosphere.

This pulse-ranging technique was the basis of radar, but the new equipment will detect atmospheric phenomena too swift for detection by earlier equipment.

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## ENGINEERING

## Floating Drydocks Used In Combat Zones

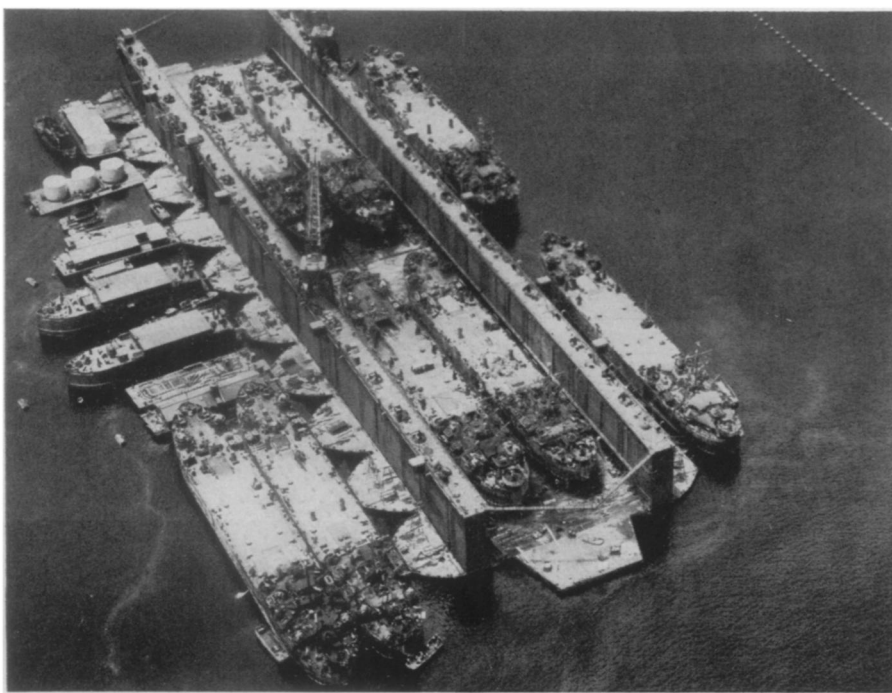
► SEVENTY-SEVEN floating drydocks, towed into war zones, enabled the Navy to make on the spot repairs that saved much valuable time during the war, it has been revealed.

Vessels ranging in size from PT boats to battleships were among the 6,947 ships raised out of the water for repair jobs in combat zones during the last year of World War II, the Navy said.

Another 19 of the floating shipyards facilitated work on 1,349 warships at ports in the United States during the year beginning October, 1944. The program that began with three floating docks in 1940 found the Navy with 150 docks at the war's end with a capacity of 1,200,000 tons.

Huge ABSD's, Advance Base Sectional Docks, provided floating repair installations for the largest battleships and aircraft carriers in the fleet.

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**REPAIRS IN COMBAT**—Nearly 7,000 ships, ranging in size from P-T boats to the 53,000-ton battleship U.S.S. Iowa, were lifted out of the water for damage repair and reconditioning by the Navy's seventy-seven floating drydocks in the combat zones during the last year of the war. The Advance Base Sectional Dock shown here has lifted four LSTs out of the water, and more are tied up for repairs.