

METEOROLOGY

Predict Distant Storms

A new radar, tailor-made for weather forecasting needs, is being installed at the Washington (D. C.) National Airport where it will improve weather prediction.

BETTER PREDICTIONS of severe weather within a 250-mile radius of the nation's capital will result from use of a new radar now being installed at Washington National Airport.

It is part of a Weather Bureau storm-warning network planned eventually to blanket the United States. The continuously operating radars are tailor-made for weather forecasting needs, including the detection and tracking of hurricanes, tornadoes and other severe storms. The first is now operating in Miami and the Washington radar is scheduled for operation by mid-September.

Some 15 of these sets are expected to be installed in as many locations by the end of the year, with 31 planned for operation by July, 1960. The next four radars, produced by Raytheon Manufacturing Company, Waltham, Mass., are scheduled for installation at New York, Brownsville, Texas, Wilmington, N. C., and Kansas City, Mo.

The new radars also show where and how much rain or snow is falling as it falls, thus enabling weathermen to warn of flash-flood threats much sooner than now possible.

Radar signals bounce off rain or snow

drops in storms and are reflected back to the antenna where they are electronically converted to the picture seen on the radar screen. Brilliancy of the image is a measure of the rain's intensity.

Although the Weather Bureau has not revealed where the other 25 radar sets will be installed, the inland and East Coast locations were chosen to give the maximum amount of protection to the greatest number of persons.

Eventually the hurricane-watching circuit will stretch along the Gulf and Atlantic Coasts from Brownsville, Texas, to Maine. Radars of a different type, although also with a 250-mile radius, are already installed at Cape Hatteras, N. C., Nantucket, Mass., and in San Juan, Puerto Rico.

Using radars, meteorologists are able to keep a continual check on storm progress and development. The new sets are convertible, operating at one of three different frequencies, 9,300, 5,600 and 2,800 megacycles, whichever is most suitable for the expected weather conditions.

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DRUG OBSERVER—A device consisting of an induction heating coil is able to open capsules and release drugs at predetermined areas of an animal's gastro-intestinal tract without surgery or any direct electrical or mechanical attachments. The absorption of oral drugs can be studied. The device, developed by the Smith Kline & French Laboratories, will eventually be used in similar studies in humans.

SURGERY

Stimulate Heart Beat Through Jugular Vein

A NEW METHOD of stimulating the heart through the jugular vein is described in *The Lancet* (August 1).

This should be particularly valuable in anesthesia emergencies, during acute heart-block or when circumstances are not favorable for methods such as heart massage that involve opening the chest cavity says Dr. F. F. Weale of Guy's Hospital, London, England.

Five dogs with experimentally induced heart block were studied. An insulated wire electrode was passed down the dog's right jugular vein into the right ventricle. An artificial cardiac "pacemaker" was then connected to the electrode and to a skin electrode. In each case, Dr. Weale reports, there was "satisfactory ventricular response" at voltages roughly a quarter of those needed for another method of stimulation.

Special tests with two of the dogs showed that some blood clots had formed, "plugging" the external jugular vein. However, clots surrounding the electrode lead did not materially obstruct the return blood flow of the superior vena cava, one of the body's main veins. There was also no evidence of burned heart tissue, the British researcher says. In purely medical cases, he explains, anticoagulants may be useful.

The method avoids the "considerable discomfort" found with "external" electrodes, Dr. Weale says.

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MEDICINE

Tranquilizers Shield Brain

Tranquilizers with their large umbrella-shaped chemical structures appear to be related to atropine in their action of shielding the brain from stresses.

TRANQUILIZERS may literally be umbrellas that protect the brain from a shower of stresses and strains.

Structurally, tranquilizers resemble atropine which is known to dry the mouth and stop intestinal movement, or curare, the Indian arrow poison that paralyzes muscles. All have large umbrella-like chemical structures which may shield the nerves from stimulating substances, Dr. T. C. Barnes, formerly of Hahnemann Medical College, Philadelphia, reported the American Pharmaceutical Association meeting in Cincinnati.

Dr. Barnes bases this explanation of tranquilizers upon the results of an experiment with neurotic mice. He found that one tranquilizing chemical, stelazine, was three times as powerful as thiorazine in subduing the neurotic behavior of the mice. Stelazine has an added piperazine ring to the three-ring umbrella structure of thiorazine, Dr. Barnes pointed out.

A good umbrella must have a handle, Dr. Barnes continued. In the phenothiazine

tranquilizers, this essential part of the structure is a row of three carbon atoms. The nerve is accustomed to this handle because it is present on several natural neurohumoral agents such as adrenalin and histamine.

The newest umbrella tranquilizer is mellaril or thioridazine which has a four-ring structure like stelazine, but which lacks the essential "handle," the three-carbon chain. This may explain why it is so weak, the researcher speculated.

A mental patient may require a gram of mellaril where five milligrams of stelazine would do the job.

In major epilepsy, the umbrella theory works very well, Dr. Barnes pointed out. All drugs used in severe fits have a phenyl or flat benzene ring structure which may have a protecting or screening effect. For example, phenobarbital is the only sleeping pill or barbiturate used in severe epilepsy, and the only phenyl "umbrella" in this large group of drugs, he explained.

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