

ELECTRONICS

VHF Mountain Reception

Discovery of "obstacle gain" effect in paths over which high frequency waves can be propagated in mountainous regions is reported.

► BOTH HOME television viewers and the military will benefit from the most recent discovery in "line-of-sight" radio waves reported to radio engineers meeting in Washington.

A "tremendous increase" in transmission of very high frequency radio waves over very long paths in mountainous regions has been found. Radio experts of the National Bureau of Standards, the Signal Corps and RCA Laboratories have just begun studying these long-range paths during the last two months.

The discovery means that people in mountainous regions where TV and FM reception was thought impossible may now be able to receive clear pictures and signals from transmitting towers placed 200 miles and more away if the transmitters are properly placed in relation to the newly discovered radio paths. And the military can get clear reception on radio messages over the same distances in such mountainous places as Alaska, Japan and Hawaii.

Reception of high frequency signals far beyond the horizon has previously been reported occasionally, but investigators had dismissed such events as irregular and undependable.

Now the radio experts have found that the radio signal is strong, transmission loss and fading are reduced "over very long paths across mountain terrain." They know of no other propagation phenomenon that involves such a tremendous increase in power — about 10,000,000 times as much power as without the effect.

The study is so new that the scientists will not predict just how far what they call the "obstacle gain" effect will carry, but they believe it would be more than 200 miles. Nor are they sure exactly how high are the frequencies thus affected. Their experiments have been carried on in the 38 to 160 megacycle range, but calculations show the effect would be just as great for 1,000 megacycles and perhaps over that.

Although their discovery brings good news to one section of military and civilian operations, it may mean trouble for another: Present proposals are to use frequencies around 1,000 megacycles for air navigation. The new long-range effect would mean interference patterns from stations too close together could be set up. These would be a considerable nuisance, and possibly dangerous, to pilots navigating with radio aids using such proposed frequencies.

The experiments were conducted by Fredric H. Dickson of the U. S. Signal Corps, John J. Egli of the Signal Corps Engineering Laboratories, Jack Herbstreit of the National Bureau of Standards and Gilbert

S. Wickizer of Radio Corporation of America Laboratories.

The extra-long propagation path in mountainous areas would also apply to the ultra high frequencies to which television bands are scheduled to switch sometime in the future.

Being too close to a mountain, however, could be a disadvantage, the engineers warn. The mountain acts like a knife edge, bending the radio waves around it by diffraction to give good reception over long distances out beyond the obstacle.

Daily and seasonal variations of the phenomenon are now being investigated by the National Bureau of Standards' Central Radio Propagation Laboratory, Boulder, Colo.

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PUBLIC HEALTH

No Radioactive Cosmetics

► RADIOACTIVE CHEMICALS, or radioisotopes, "have no place in cosmetics because of the danger associated with their use," W. B. Rankin of the U. S. Food and Drug Administration declared at the Oak Ridge Institute of Nuclear Studies, Tenn.

FDA allows the use of such chemicals in drugs, however, when satisfactory evidence of their safety has been presented. Some drugs with radioactive chemicals in them are now being legally shipped in interstate commerce.

One firm, Mr. Rankin said, is producing and distributing material quantities of radioactive iodine, called iodine 131, for use in the study and treatment of certain thyroid disorders.

The case for radioactive chemicals being put into foods or used for sterilization of foods and drugs requires more study. Cold sterilization of food by radioactivity is "an attractive goal," Mr. Rankin said, but more information is needed on whether the irradiation would lessen the nourishing value of the food or the remedial activity of the drug. Bonds in complex compounds might be disrupted to give entirely different chemicals which might or might not be harmful.

Whether foods or drugs sterilized by irradiation are poisonous in any way, for example, whether they could produce cancer if taken over long periods, must also be determined before such sterilization methods could be considered safe.

Use of radioisotopes as tracers in food manufacture, for example, to check the

• RADIO

Saturday, May 16, 1953, 3:15-3:30 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Stephen J. Toth, associate professor in soils, Rutgers University, New Brunswick, N. J., discusses "Recent Advances in Soil Chemistry."

MINERALOGY

New Uranium Mineral Named for Chemicals

► UMOHOITE IS the synthesized name of a newly-found natural uranium mineral announced by Prof. Paul F. Kerr of Columbia University, New York. Found so far in only one Marysvale, Utah, mine, it contains 48% uranium, compared with 50% to 65% in the usual pitchblende ore. Its name comes from the elements in it, the chemical symbols for uranium, U, molybdenum, Mo, and hydrogen, H, and oxygen, O, in water, plus the suffix used for minerals, "ite."

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thoroughness with which a small amount of an important ingredient is incorporated in a large mix of food, might be useful and reduce production costs. But unless it can be shown that such use of radioisotopes will not be dangerous to the consumer and that there is a manufacturing problem which can be solved only by the use of a radioisotope, such use would not be permitted.

Radioisotopes can be used in treatment devices or machines legally if these have adequate directions for use, precautions against misuse and are used under competent medical supervision.

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CHEMISTRY

List Variety of Atoms For Sale by Oak Ridge

► FOR SALE: Atomic radiation in the form of radioactive isotopes of chemical elements, more than a hundred of them. Also 175 isotopes or atomic varieties that are not radioactive but stable are on sale by the Oak Ridge National Laboratory.

A new catalogue, the first since 1951, shows prices as low as \$5 per curie for radioactive cobalt in large quantities. This isotope is used as a substitute for radium and X-rays in industry and medicine, including cancer treatment.

Radioisotopes and stable isotopes are used in medicine, agriculture, industry and other research.

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