



HEART OF UNIQUE RADIO STATION

Here is the automatic tuning panel of the radio transmitter which sends out, every 15 minutes, signals in frequencies varying from 516 to 16,000 kilocycles.

them. Thus W3XFE, while broadcasting continuously, lives in a radio world all its own.

No Loud Speaker

A visit to the station shows familiar control panels, but no loud speakers or the "da-da-dit-da" purr of a spark transmitter. All reception of the signals from far above the stratosphere is on a photographic recorder which makes a continuous and permanent record of the height at which any given frequency of signal is reflected.

A continuous probing of the radio reflecting layers, known technically as the E, F, F₁ and F₂ layers, has made possible a study of the changing daily pattern of these ionized regions above the earth. Seasonal patterns are also disclosed and the effect of increasing solar activity in the form of sunspots can be correlated with an increase or decrease in the effectiveness of radio transmission on earth.

The scientists of Carnegie Institution are not content to study such profound world-wide changes in the outer limits of the earth's ionized layers from a single station. Similar studies are being undertaken at Huancayo magnetic observatory high in the Andes Mountains of South America and at the Watheroo station, Australia.

To obtain better data and simplified operation of equipment the automatic radio transmitter just described has been built and successfully passed its tests. Installation of such transmitters is now under way at these widely spaced observatories with the hope that other independent and competent laboratories will take up the problem with similar apparatus.

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MEDICINE

Cancer Weapon From Normal Body Tissue

NORMAL, healthy tissue of the body itself may yield an effective weapon against cancer. This possibility appears from experiments reported by Dr. James B. Murphy of the Rockefeller Institute for Medical Research at the cancer symposium held by the American Association for the Advancement of Science.

Dr. Murphy has extracted from various kinds of body tissues a substance which checks the growth of cancers and another substance which stimulates their growth. The work is still in the laboratory stage and has not yet progressed to the development of anything like a practical means of curing cancer. But Dr. Murphy says of his studies:

"The results are definite and leave no

doubt that normal tissue may yield a substance apparently harmless to normal cells which prevents or retards the growth of cancer cells."

From extracts of fowl tumors Dr. Murphy obtained a substance which, when concentrated, neutralized the filterable causative agent of the tumor and prevented the growth of a type of cancer in other animals besides fowl.

A similar cancer-growth-checking substance was found in several active normal tissues. Chief among these tissues are placenta, embryo, skin and pre-lactating mammary gland. Material from these tissues definitely checked the growth of transplanted cancers in laboratory animals and also checked the growth of new cancers that occurred naturally or spontaneously in such animals.

"In the case of one tissue, the pre-lactating mammary gland," Dr. Murphy reported, "it has been possible to separate out both an inhibiting (checking) and a stimulating factor for transplanted cancer."

Dr. Murphy's studies were undertaken on the theory that cancer is the result of a break in the supposed balancing mechanism of the cell which consists of a stimulating and retarding factor. The evidence obtained from his studies cannot, he said, "be considered adequate support for the general hypothesis that malignancy is a break in the internal control mechanism of the cell."

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TECHNOLOGY

Birdproof Windshield Sought by Scientists

SCIENTISTS at the National Bureau of Standards are searching for some new transparent plastic material which will be strong enough to serve as an airplane windshield for those accidents where a bird flies against it. Another need is for a drinking cup material for use in prisons so that lethal weapons cannot be easily obtained as with present heavy crockery.

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A dictionary of American English, dealing mainly with words that have originated in the United States, is being compiled.

A Japanese company is to market a new paint enamel made from urea resin which is designed to withstand heat without discoloring, even up to 150 degrees Centigrade.