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### PUBLIC HEALTH

## Radioactive Debris From Bomb Tests Spreads Fast

RADIOACTIVE debris from hydrogen bomb tests at the U. S. Pacific Proving Ground in the Eniwetok-Bikini area spreads rapidly in the lower atmosphere, even crossing the equator, scientists at the Naval Research Laboratory have found.

They charted the distribution of a new tracer, radioactive tungsten produced in the 1958 Hardtack series of nuclear tests, at 18 stations located principally along the 80th meridian, from Coral Harbour, Northwest Territories, Canada, to Punta Arenas, Chile. Other fission products, such as strontium-90, were also collected and their distribution analyzed.

The NRL scientists reported their survey showed for the first time that an "appreciable quantity of radioactive matter from a known source in the Northern Hemisphere has been identified south of the equator."

Thus, radioactive debris introduced into the lower atmosphere at a particular latitude does not remain in any restricted zone near that latitude, as had been thought, but spreads rapidly throughout the hemisphere.

"If such materials are introduced simultaneously on both sides of the equator, as happened in this case, rapid spread throughout both hemispheres occurs," the scientists concluded. Their report on contamination of the air by radioactivity appears in *Science* (July 17).

The findings were made by Drs. L. B. Lockhart Jr., R. L. Patterson Jr., A. W. Saunders Jr. and the late R. A. Baus.

Science News Letter, August 1, 1959

### ZOOLOGY

## Marked Whales Yield Data on Age at Maturity

A MALE WHALE takes twice as long to reach sexual maturity as scientists had thought.

Previous estimates of this age, based largely on such things as counting the "rings" in whale bone or baleen, are in error, an Australian scientist reported.

A study of two whales that had been marked several years ago has given scientists

a "standard" for assigning whales a minimum age at maturity, W. H. Dawbin of the University of Sydney says. When they were recently re-examined it was possible to estimate maturity more accurately.

The minimum age for a mature male whale appears to be four years, the researcher says in *Nature* (June 20). The female may reach maturity earlier since the minimum age for that sex was estimated to be three years. With these ages as standards, researchers should now be able to use various organs for accurate estimations of a whale's age at maturity.

Science News Letter, August 1, 1959

### TECHNOLOGY

## Pushbutton Telephones Under Development

A PUSHBUTTON telephone device, which may replace the rotary dial, is being developed at the Bell Telephone Laboratories, New York.

The tiny transistor, because of its ability to amplify electronic signals while using little power and producing no heat, makes the pushbutton calling possible.

Each telephone contains a transistorized oscillator that generates two coded musical tones for each of the phone's ten buttons. The tones are similar to those sometimes heard while a long-distance connection is being made.

Simultaneously, the tones are transmitted to a central switching office, from where the call moves on to the recipient. This routing is similar to that of present switching systems, which, however, do not understand the "two-tone language." To make use of existing switching systems, Bell has developed a machine to translate the tones into usable signals.

Science News Letter, August 1, 1959

### PHYSICS

## Satellite Could Check Einstein's Red Shift

A SATELLITE equipped with a clock and special radio equipment could quickly check the gravitational red shift resulting from Einstein's general theory of relativity.

The measurement would take only 30 seconds or less, not the several days or weeks of previously proposed methods. The short-time experiment is outlined by Drs. R. S. Badessa, R. L. Kent and J. C. Nowell of Massachusetts Institute of Technology in the *Physical Review Letters* (July 15).

The gravitational red shift of Einstein's general theory is an effect that results in clocks running at different rates when they are in different gravitational fields. The experiment would involve comparing the time kept by a stable clock in a satellite with an identical one on the ground.

If the transmitter on the satellite were operating at a frequency of 500 megacycles, the largest expected frequency difference due to the Einstein gravitational shift would be one-half a cycle, which can be accurately determined with presently available clocks.

Science News Letter, August 1, 1959

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