GEOPHYSICS

Day Getting Longer

Scientists for 200 years have been puzzled by the gradual lengthening of the 24-hour day. Loss of energy in ocean tides was once believed to be the cause. Today it is explained by the slowing down of the earth's rotation.

THE 24-HOUR DAY is getting a little longer every year although the exact cause is still a mystery.

Measured by two successive transits of the sun or a star across the zenith, the day is lengthening at the rate of about one hundred-thousandth of a second each day per year, according to Profs. Walter H. Munk of the Scripps Institution of Oceanography, La Jolla, Calif., and Gordon J. F. MacDonald of the University of California at Los Angeles.

This means that now the day is actually two-hundredths of a second longer than a day was 2,000 years ago. Taking the mean of the two-hundredths figure, which is one-hundredth of a second, and multiplying it by the number of days in the last 2,000 years, we get an accumulated time of 7,300 seconds, or a little more than two hours.

The sun's center, therefore, now passes the same zenith two hours later than it did 2,000 years ago, and a clock, set at the time of Christ's birth, would now be about two hours fast.

The reason is the gradual slowing down of the earth's rotation, so that it now takes any spot on the globe longer to line up twice with the same celestial measuring point than in preceding years.

The first scientist puzzled by this phenomenon was the 18th century English astronomer, Edmund Halley. He found that the astronomical dates for eclipses of the pre-Christian era did not agree with the dates indicated on early Babylonian tablets and Greek papyri.

Later astronomers and mathematicians continued to investigate, and finally decided that the slowing of the earth's rotation resulted from the loss of energy in ocean tides.

The explanation, however, did not satisfy the two University of California professors. By re-examining the ocean tides and computing their forces, they concluded that the energy of the tides is not enough to account for the slowing of the earth's rotation.

"We still do not know what causes the earth to slow down," Prof. MacDonald said, "but we do know that the hitherto accepted explanation is invalid. Now we can go on and try to find the reason."

The findings of the two scientists will be included in their book on "The Rotation of the Earth," to be published by Cambridge University, England.

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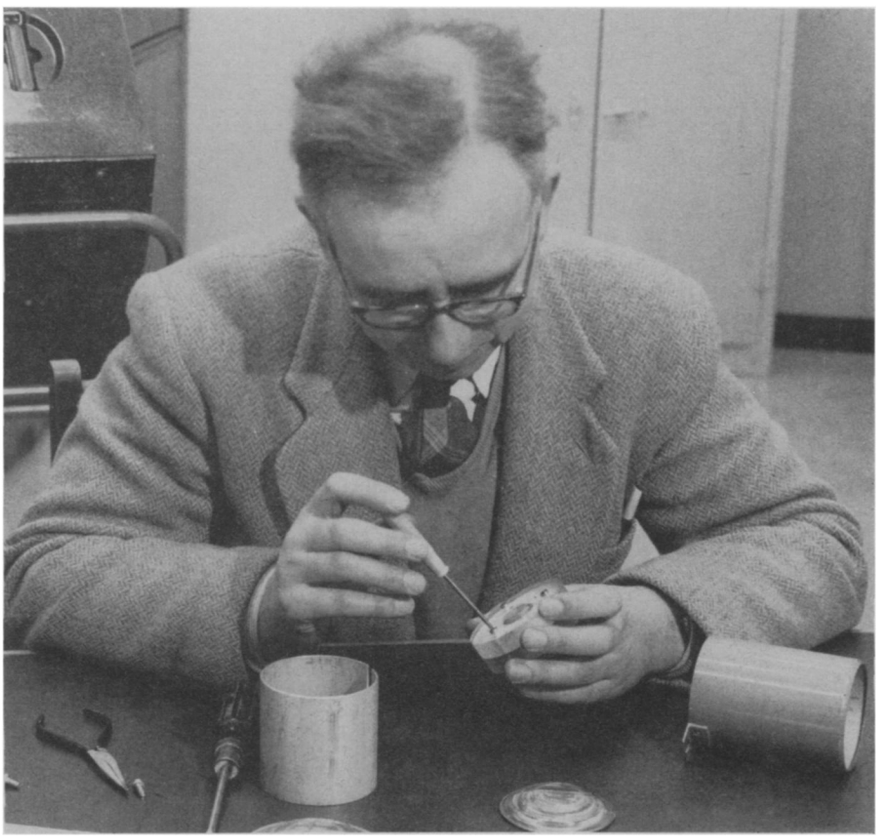

ATOMIC LAMP—The radioactive gas-filled lamp bulb is being placed between two spheres of plastic, then placed in a metal can fitted with a prism and mounted for indicator use.

MINERALOGY

Libyan Desert Glass Found Earthly in Origin

THE PECULIAR silica-glass formations found on the Libyan Desert are earthly in origin, not objects from space.

Dr. Alvin J. Cohen of the Mellon Institute, Pittsburgh, Pa., reached this conclusion from an analysis of the germanium content of the objects, compared with many other materials, including meteoritic stones. He found that the composition of the silica-glass is chemically and mineralogically similar to the sands of the Libyan desert.

The objects were probably formed by the impact of a "cosmic body," Dr. Cohen reports in *Nature* (May 30).

Science News Letter, June 13, 1959

ENGINEERING

Nuclear-Powered Light Will Work for Years

AN ATOMIC lamp that can work for ten or twelve years without any power supply has been developed by British scientists. Although the experimental lamps are tiny, about twice the size of a matchstick, they mark a major development in a new form of lighting.

The lamps, developed by British Associated Electrical Industries, Leicester, England, can immediately be used as indicator lights. When larger lamps are developed they may be used as markers for buoys, life rafts, ammunition dumps and even as warning lights on road obstructions.

The lamps actually look like glass matches. They have a long thin glass stem that bulges out into a small bubble at one end. The bubble is coated with phosphors, and the tube is filled with radioactive gas. The radioactive rays emitted by the gas cause the phosphor to glow brilliantly. It needs no other form of energy, and will keep on glowing for a decade.

At present the lights are still in the laboratory stage. Developers of the lights claim they are safe. Lamps using tritium gas give out such weak radioactive rays they do not even penetrate the glass bulb. Krypton 85 is another gas that has been used in the lamps, and lamps filled with this gas need lead shielding to make them completely safe.

Science News Letter, June 13, 1959

The radioisotope, antimony-124, is being used to make *dynamite* safer, a unique role for a product created by an atomic reactor.