fixed propeller made to undergo the vibrations by having its propeller shaft twisted back and forth mechanically. Thus strains and stresses were experienced in the propeller blade similar to those encountered during normal operation. Most important, they could be measured.

It was found that the vibrations were those of resonance wherein tiny forces, timed at just the right period, built up and amplified one another until the total effect was enough to snap the blade.

It is such resonance vibrations which are feared when a column of troops is ordered to break step when marching across a bridge. If all the footbeats happened to be timed near the natural vibration period of the bridge, the latter might collapse from the built-up stresses created.

For the experimental propellers two vibration periods were found; one at the frequency of 35 times a second and the other 130 times a second. For the lower frequency of vibration it was found that the greatest stresses occurred at the middle of the propeller blade.

Stresses experienced were determined by measurements on a special strain gage invented by Dr. L. B. Tuckerman, also of the Bureau.

In the laboratory the scientists made eight propellers break artificially while vibrating with their fundamental frequency. All the blades broke at the middle where the stresses were within a few per cent. of the maximum measured.

Science News Letter, March 23, 1935

PHYSICS

British Research Upsets Values for Atomic Weights

New Atomic Weight for Hydrogen, if Verified, Will Make all Atomic Weight Tables Obsolete

A DRASTIC shakeup in science's conception of the weights of the atoms which make up everything in the universe appears imminent from a report to the Royal Society, London, by Prof. M. L. E. Oliphant and A. E. Kempton of Cavendish Laboratories, Cambridge University.

Lord Rutherford, commenting on the discoveries of his Cavendish colleagues, said that as a consequence of their new discoveries in transmutation experiments on the relationship between hydrogen and oxygen in ordinary water, science sees a way to get around what has been a serious conflict in reconciling disintegration experiments with the laws of the conservation of energy.

Due to Error

The worrisome trouble in the past, Lord Rutherford said, appears to have been that the widely recognized measurements on the ratio of the weights of oxygen and hydrogen in water erred by a factor of one part in four thousand.

Correcting Prof. F. W. Aston's measurements made on his original "atom scale," the mass spectrograph, by this factor. Prof. Oliphant finds a beautiful reconciliation for the energies of particles shot out in atom-smashing experiments with the theoretical loss of mass in the process.

The discrepancies in the past have raised the question whether more undiscovered fundamental particles exist. The new Cavendish experiments discount such questions.

The new atomic weight of hydrogen is now 1.0081 instead of 1.0078. If the new finding is substantiated independently, every atomic weight table in the science textbooks of the world will be obsolete, for the weights of the various atoms are all based on the weight of hydrogen. Any changes in the weight of the latter involve all the other 92 elements.

Determining atomic weights by measuring the distance they fly from smashed atoms is now a method more than ten times as accurate as the mass spectrograph, heretofore considered the most accurate of all atom scales, says the report.

Science News Letter, March 23, 1935

A Swedish anthropologist is studying Indian tribes in the comparativaly little known lowlands of eastern Colombia, along tributaries of the Rio Guaviare.

PUBLIC HEALTH

High Maternal Death Rate Not Explained by Reporting

THE large number of deaths of American mothers in childbirth as compared with mothers in other countries cannot be explained away by laying the blame on methods of reporting, it appears from a study conducted by Dr. Elizabeth C. Tandy of the U. S. Children's Bureau.

"The official figure of the United States, which in the last few years has exceeded that of every country except Scotland, remains high no matter what method of assignment is used," Dr. Tandy states in her report.

Differences in methods of assigning causes of deaths are not enough to explain the high maternal mortality rate in the United States, as compared with foreign countries, Dr. Tandy found.

Even if the method of the country assigning the smallest proportion of deaths to the puerperal state were in use in the United States, the United States figure would still exceed that of all 16 countries included in the study, except Australia, Canada, Chile and Scotland.

Science News Letter, March 23, 1935

GEOPHYSICS

People Inside the Earth Excited America in 1822

PEOPLE may be living inside the earth. The United States Government ought to send "in" an expedition to explore and find out.

This fantastic theory, which excited America over a century ago, is now arousing scientific attention, and amusement, again. In the rare collections of the Smithsonian Institution, research workers have found a broadside dated September 14, 1822, urging the public to believe in a hollow earth, the interior of which could be entered from North or South Polar regions. A yellowed, fragile pamphlet eloquently denouncing the theory has also come to light.

The broadside was written by the author of this hollow earth theory, Captain John Cleves Symmes, retired army officer, who bombarded the American public and institutions of learning with his geophysical ideas from 1818 to 1829. Groups of loyal Symmesites all over the country arose. Petitions urged Congress to send an expedition up to the vast hole at the North Pole to sail round the gentle curve and explore