menters have found that both Aston and Bainbridge are wrong in the value of the mass of the mass one hydrogen isotope on the physical scale. It should be 1.0081 in place of 1.0078. Assume, for the sake of argument, that this new figure is correct. On reducing it to the chemical scale, we then get 1.00785 as the predicted value of mass one hydrogen. If there is an abundance of one part in 30,000 in the experiments made on the atomic weight of hydrogen, then, for this mixture, the atomic weight should have a value, on the chemical scale, of 1.00788 in order to agree with the new Cavendish value. This value of 1.00788 agrees very well with the observed chemical value of 1.00777 previously quoted. Hence the Cavendish work practically clears up the discrepancy between the atomic weight of hydrogen and the mass spectograph values. For the first time, it gives independent evidence of the essential correctness of the present accepted atomic weight of hydrogen, and clears up a serious discrepancy of several years' standing.

Science News Letter, April 27, 1935

PHYSICS

New Atom Weighings Show Masses Need Corrections

NEW weighings of the atoms just completed at Cambridge, England, by Dr. F. W. Aston, Nobelist and authority on atomic weight, give confirmation of the announcement made to the Royal Society about a fortnight ago by Lord Rutherford and his colleagues that some of the weights of common elements need revision. (*SNL, March* 23, *p.* 180)

Using a partially completed mass spectrograph or atom weigher, Dr. Aston announces in a letter to *Nature,* the following masses: For hydrogen, 1.0081; for deuterium or hydrogen of mass two, 2.0148; for helium, 4.0041; for carbon, 12.0048.

The famous Aston value for lightweight hydrogen determined by him in 1926 was 1.0078, contrasted with the new value of 1.0081.

Inaccurate Standard

What has happened now is as though the official pound weight of a nation were found to be slightly inaccurate. The weights of atoms are referred to the weight of oxygen taken as 16, either as it occurs on the average in nature or as the lightest of the three varieties, depending upon whether the determination is by chemical or physical methods.

The team of Cavendish Laboratory researchers, Prof. M. L. E. Oliphant, A. E. Kempton and Lord Rutherford, first suggested the need of revision as a result of the energies with which bombarded atoms artificially disintegrated. The distances the atom particles shoot out from the exploding atoms allow calculations of the masses of the atoms.

Dr. Aston admits that these disintegration experiments as atom weighers are "much more delicate but less direct." Dr. Aston's new atomic weights are as yet provisional and in no case does he claim greater accuracy than one in 10,000.

Scientists are interested in the slight differences in atomic weights discovered because they are of large importance in computing the energy within atoms and developing theories as to the existence of isotopes or varieties of atoms.

"I am never likely to regret the underestimate of hydrogen's atomic weight that I made in 1926," Dr. Aston said, "however serious it may ultimately turn out to be, because of the fundamental part it played in encouraging the search for heavy weight hydrogen (called deuterium) which was discovered in America."

Science News Letter, April 27, 1935

SAVER OF GOLD

Corduroy similar to that used in a lady's lounging pajamas or a boy's school knickerbockers, but having wider cords, is used to entrap gold from the gold ore "pulp" stream which is caused to flow over it. The photograph, showing an enlarged vertical section of the corduroy is used through courtesy of Engineering and Mining Journal.

PHYSICS

Einstein Proved Right Again By Light From Hottest Stars

EINSTEIN is again proved right, this time by light from the universe's hottest, most luminous and most massive stars, observed by Dr. Robert J. Trumpler of the University of California's Lick Observatory, on Mt. Hamilton, Calif., who told the National Academy of Sciences about it at its opening meeting.

One of the three famous tests of Einstein's general theory of relativity was proof of what astronomers call "red-shift," which means that a large mass like the sun or another star pulls back on the light energy it radiates and increases its wavelength. The famous heavy-weight dwarf star companion of brilliant Sirius, whose matter is 4000 times as dense as on earth, showed this predicted effect in observations at Mt. Wilson and Lick Observatories about a decade ago, but later observations indicated that this heavy-weight bantam star may be brighter in light than suspected and also that it may be twins. Some felt this spoiled its support of Einstein.

Dr. Trumpler searched for and found the Einstein shift effect in light from what are called the class O stars in the great star clusters of our Milky Way.

The astronomer's study is complicated by the fact that stars often rush away from or toward the earth at such tremendous speeds that this also changes wavelengths, a phenomenon called the Doppler shift. Dr. Trumpler got around this difficulty by comparing small and large stars of the same cluster so that their motions could be ignored.

The class O stars showed such greater redshifts of their light that Dr. Trumpler is confident that they uphold relativity. Using the theoretical value of the relation of red-shift to mass, he then used the red-shift to determine that the hot and luminous class O stars are on the average 180 times as massive as the sun.

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