

CHEMISTRY

Rare Heavy Oxygen Water Made by British-German Team

Demonstrate New Apparatus Designed to Produce Four Tenths of a Drop a Day of the Precious Liquid

WHAT is probably the world's rarest liquid, "heavy oxygen water," is now being produced at Manchester University, England, by means of a recently constructed diffusion apparatus.

Only a few drops of the heavy oxygen water exist. The new apparatus in which Lecturer J. B. M. Herbert and Prof. M. Polanyi of Manchester University demonstrated the production of heavy oxygen water is designed to produce 20 milligrams of the water per day, which is about four-tenths of a drop.

One atom out of every hundred of the oxygen atoms in heavy oxygen water has a mass of eighteen instead of the usual mass sixteen of ordinary oxygen. In ordinary water the normal proportion is about one in 500. Scientists consider this concentration of the heaviest oxygen as a real achievement since the difficulties are much greater than in separating the famous three kinds of hydrogen recently discovered.

Prof. G. Hertz of Berlin made the world's first sample of heavy oxygen water and presented the precious ten drops (half a gram) to Prof. Polanyi, who was formerly professor of physical chemistry at the Kaiser Wilhelm Institute in Berlin. The isotopes or atom varieties of neon, gas now used in electric signs, were also separated by Prof. Hertz.

Very Complex

The Manchester University apparatus for producing heavy oxygen water is very complex and consists of nine mercury vapor diffusion pumps circulating gas through porous clay called steatite. The very slight difference in weight between the light and heavy oxygens in the water vapor makes the concentrating process slow and tedious. Even compared with its use upon gases like neon, the process is slow because the water vapor condenses upon the surfaces of the clay tubes.

Mr. Herbert explained that higher concentrations of heavy oxygen water

could be obtained either by repressing or by using a large number of diffusion units. Five per cent. concentration is obtainable by the use of diffusion. By a combination of methods, Mr. Herbert believes that in time pure 100 per cent. heavy oxygen water might be obtained. But it would probably take years to achieve this goal.

Prof. Polanyi is at present in Moscow where he is consulting with Soviet scientists engaged in similar work.

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ASTRONOMY

Giant Meteorite Found In Southwestern Kansas

See Front Cover

A HUGE "stone from the sky," a stony meteorite believed to be exceeded in weight by only one other in the world, has been added to the Nininger meteorite collection in the Colorado Museum of Natural History in Den-

ver. Its dimensions are 35 by 22 by 21 inches and it weighs an estimated 700 pounds, plus an additional 50 pounds of broken-off fragments.

The clue that led to its discovery was supplied by J. D. Lynch, Jr., a senior at Hugoton High School. Hugoton is the county seat of Steven County, in southwestern Kansas.

Prof. H. H. Nininger, researcher on meteorites, recently lectured before the Hugoton student body, exhibiting samples of the pitted lumps of iron and stone that occasionally fall from the heavens. Mr. Lynch recognized one of these as similar to a stone that a few years ago crumpled a plowshare for him while he was working in the field. He told Prof. Nininger of the occurrence, and the two, with the latter's young son, Bob, went to the spot where the offending stone had been thrown to get it out of the way.

It proved to be meteoric, but only a fragment of an evidently much larger mass. A search in the field soon turned up a stony meteorite at a maximum depth of 36 inches. It is evidently a very old fall, but there is at present no way of determining its exact date.

Prof. Nininger and Mr. Lynch dug it up, together with a number of fragments, and prepared it for shipment to the Museum in Denver. Mr. Lynch is shown in the front cover picture, wrestling with the great stone in its pit.

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THREE-DIMENSIONAL X-RAY

A new aid for diagnosis, a means of viewing a patient in three dimensions by X-rays, has been invented by Dr. O. Russo, physicist at the State Roentgen Institute, Moscow, U.S.S.R. Dr. Russo (left) is demonstrating to Dr. E. Hamburger, director of the Institute, his new stereoscopic viewing mechanism with which it is possible to view the internal organs of a patient as he swallows, coughs or breathes. Instead of seeing the organs as shadows in silhouette, the doctor sees them in the same relative position as they have within the body in real life.