answer is that you cannot. And thus we'll leave you with the paradoxical statement of Prog. Bridgman that "A body does not break because there are unbalanced forces acting on the atoms, but there are unbalanced forces acting on the atoms because the body breaks."

This leaves the situation about like the old question of the chicken and the egg, but it does indicate that there is still plenty to learn about the more simple things.

Science News Letter, August 13, 1938

GEOLOGY—CHEMISTRY

CO_2 Gas Wells May Yield "Air Fertilizer" For Crops

NATURAL gas is not always something to burn in cookstoves and industrial furnaces. Sometimes the gas that pours from the earth's veins is the least combustible thing in the world—carbon dioxide. Some wells yield carbon dioxide at pressures approaching 1000 pounds per square inch, and there is one "gasser" in Mexico that discharges 150 million cubic feet a day, enough to make 9,000 tons of dry ice.

Use should be made of this great natural resource, says Prof. Frank E. E. Germann of the University of Colorado. To some extent this is already being done, thanks to the rise of the dry-ice industry. Where it would be uneconomic to ship the carbon dioxide as a liquid in cylinders because of the long distance to market, dry ice is light enough, and loses so little in transit, that it can be made and transported at a profit.

But an even greater use can be found for the gas by piping it to market-garden regions and using it to "fertilize" the air around growing plants, Prof. Germann feels. Plants make food out of carbon dioxide in the presence of sunlight, and the three hundredths of one per cent. of the atmosphere which it now constitutes can be increased many fold by artificial addition, with great advantage to plant growth.

The most ready and obvious way of using carbon dioxide to enrich the air around plants would be in greenhouses, especially in connection with one of the methods of soilless cultivation recently developed, and possibly also with artificial light. However, Prof. Germann believes that it may even be possible to flood open fields with it, at least in low concentrations.

Science News Letter, August 13, 1938

CHEMISTRY

Heavier Kinds of Nitrogen And Sulfur Atoms Produced

WHEN a factory starts to produce a new kind of product, that's news. When the product consists of a kind of matter that has never been available before, that should be even bigger news.

At Columbia University in New York City, Dr. Harold C. Urey is engaged in manufacturing for scientific purposes relatively pure isotopes, kinds of atoms that a few years ago science did not realize existed.

Dr. Urey is a winner of the Nobel prize in chemistry for his discovery of what is now called deuterium, the kind of hydrogen that is twice as heavy as the common kind. Deuterium (D) is now available in the form of heavy water and otherwise in extreme purity and in sufficient quantity.

Scientists use deuterium to tag the way compounds behave during chemical reaction. They are finding that the heavy kind of hydrogen does modify the compounds in which it takes the place of common, light-weight hydrogen although it is not deadly as some feared—or hoped—when it was first discovered.

Now Dr. Urey is separating out two other isotopes, nitrogen (N) of mass 15 and sulfur (S) of mass 34, which is a much more difficult task. He uses a sort of giant still that is 150 feet tall, or rather would be if a very trick, non-valve pump for gases and liquids did not allow him to put the whole apparatus on one floor. The heavier atoms of nitrogen 15 (the common nitrogen is mass 14) and of sulfur 34 (the common sulfur is mass 32) tend to separate out at the bottom. He is treating raw materials by the ton.

Just now there are only scientific uses, but you never can tell just when some industrial use will be found. Costs? Per gram-atom, D is $10 commercial; N 15 is $180 and S 34 is $40, for materials used.

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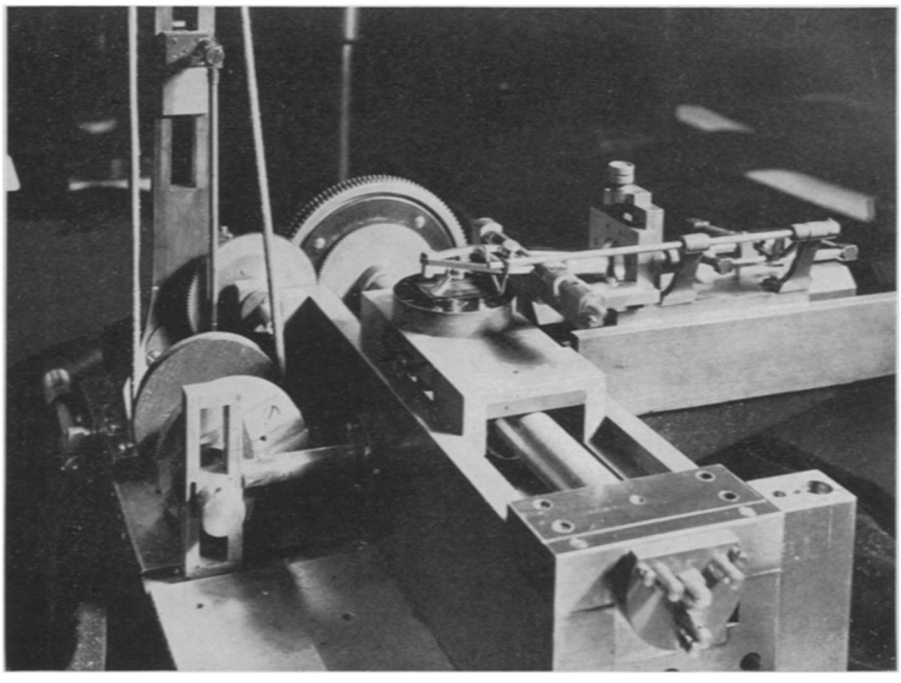

270,000 LINES TO THE INCH

Ruling more than a quarter of a million lines to the inch on metal plates, this machine prepares diffraction gratings for use in astronomy and physics, to split light up into its spectrum, much more accurately than is possible with a prism. The ruling engine, built at the University of Chicago by the late Prof. Albert A. Michelson, was exhibited recently at the Museum of Science and Industry in Chicago.