tube is pointed upward, and hydrochloric acid of from 6-10 normal concentration is poured down the tube B, until the electrodes are somewhat more than covered. A little water is next poured down the funnel tube, D, and the apparatus is tipped so that the water flows toward the side to which the negative pole of the battery is to be attached, and the two side tubes are then filled to the same level with water saturated with chlorine. The pure water will then be on the top of the column next to the hydrogen evolved. The electrodes are attached to a storage battery or direct current lighting circuit reduced to give about 10-12 volts, and a current of about 1 ampere. The evolved gases are conducted out of the apparatus through A until the two gases seem to be evolved at the same rate. A turn of the cock, C, to a position illustrated in the Figure diverts the gases to their respective sides of the apparatus to be measured.

R. H. BROWNLEE.

UNIVERSITY OF CHICAGO.

Note on Recharging Oxygen Gas Tanks.—As it costs about $15, including the express charges and customs duties, to send an oxygen tank from here to New York City to be filled, we have adopted Hempel's method[1] of generating oxygen to the filling of such a tank.

To set up the apparatus a heavy brass coupling was screwed to the oxygen outlet of the tank, threaded to take an iron T pipe of one-half inch inside diameter. Into one opening of the T was screwed a pressure gage reading up to 200 pounds. The generator was made of a piece of double extra heavy steel pipe, 2 feet long by 2 inches in diameter, one end closed by a steel coupling and a heavy cast iron plug. The other end had fitted to it a suitable reducing nipple and a piece of one-half inch pipe 6 feet long threaded at the end. The mixture for generating oxygen was prepared by heating one kilo of manganese dioxide for about six hours on a thin steel plate over four Bunsen burners in order to burn off all organic matter. The commercial article on hand was far from pure, containing bits of sawdust, roots and trash very intimately mixed, and this preliminary heating was quite necessary. After cooling the peroxide, it was all passed through a 40-mesh sieve and then mixed with one kilo of potassium chlorate also ground to pass a 40-mesh sieve. Four hundred grams of the mixture were used for charging the generator. The generator was then ready to connect to the tank, but both the generator and the connecting pipes were heated to a red heat for a few minutes to get rid of the oil used by the gas fitters, a precaution

[1] Hempel's Methods of Gas Analysis, translated by L. M. Dennis, p. 360.

which was very necessary. After the pipe cooled a piece of brass gauze about 6 by 10 inches was rolled up loosely and put in the generator as recommended by Hempel for removing traces of chlorine. It also acted as a sort of porous plug to prevent the mixture from falling out when the generator was being charged. The apparatus, after charging, was connected with the gage and tank and was heated in an open field by means of a fire of kindling wood. The fire should be lighted at the end of the generator next the tank ; if the reverse, the oxygen in being disengaged tends to blow the powder up the pipe and so clog the needle valve.

After about twenty minutes the fire burned out and the needle valve on the tank was closed. The gage showed 21 lbs. pressure. The hard compact mass of potassium chloride and manganese dioxide were dislodged by a chisel bar [1], and the generator was then filled again with 800 grams of the mixture, and heated as before. The process was repeated till a pressure of 200 pounds was obtained. To secure this pressure of 200 lbs. it required 2 kilos of potassium chlorate (commercial), worth about $1.00 and 2 kilos of manganese peroxide worth about 40 cents. The material for fittings and labor costs about $1.50, but the generator is good for hundreds of charging operations. Leaky joints can be tightened with a paste of zinc oxide and zinc chloride.

I find this method of charging oxygen tanks safe and economical. I have never used more than 800 grams of the mixture for generating oxygen, not because I did not consider it safe but on account of the size of the generator.

RANDOLPH BOLLING.

N. S. STEEL AND COAL CO.,
Sydney Mines, N. S.

A Strange Case of Poisoning.—In the investigations of certain quinazolines by Dr. H. A. Seil and the writer last spring we attempted to brominate 2-methyl-5-nitro-4-ketodihydroquinazoline by various methods, and found that in the presence of acetic anhydride the reaction proceeded most vigorously. The quinazoline was dissolved in acetic anhydride and a solution of bromine in acetic anhydride added at ordinary temperature. The reaction began immediately, with evolution of sufficient heat to raise the temperature rapidly to the boiling-point of the anhydride; hydrogen bromide was evolved in large amount, and unless the reaction was carried out with care the contents of the beaker were apt to foam over. As the result of the reaction both quinazoline and anhydride were brominated. Solutions of bromine

[1] Water will not dissolve this mass in its position in the pipe.