larger plant on the same plan, adding to it the special arrangements for the liquefaction of hydrogen. The apparatus took a whole year to build and perfect, and after many trial tests, followed by defeat, he started on May 10th to cool hydrogen down to —205°C., allowing it to escape continually under a pressure of 180 atmospheres from the nozzle of a coil of pipe at the rate of ten to fifteen cubic feet per minute. As it escaped it was conducted directly into a vacuum vessel doubly silvered and of special construction, surrounded by a space which was kept below the temperature of —200°C.

These elaborate precautions were successful, for liquid hydrogen began to drop from this vacuum vessel into another, doubly isolated by being enclosed within a third vessel, and in five minutes 20C.c. of hydrogen were collected. Had a sufficient supply of hydrogen been available, Professor Dewar thought he could have obtained a whole pailful of the interesting liquid. As it was, the hydrogen jet quickly became frozen up, owing to the solidification of air inside the pipes. The yield of liquid hydrogen was about one per cent. of the gas taken. Repeating this operation on May 12, 40 C.c. were collected. The Professor contented himself with mentioning a few characters and properties of the liquid obtained, reserving a more complete description of them for a future communication. Liquid hydrogen, as obtained above, is a colorless liquid, showing a meniscus as distinct as that of water; its refractive index and dispersion are high, and it shows no absorption spectra. A piece of glass tubing was sealed at one end, and this end was immersed in the liquid. Abundance of solid air immediately collected inside the glass tube. A sample of helium most carefully prepared from the gas from the King's Well at Bath was immersed in the liquid hydrogen, when the helium at once appeared as a liquid. Much interest must naturally centre round this experiment, because it will be remembered that there appeared, in the Cracow Academy *Bulletin* of 1896, a paper by Olszewski, announcing a research on the liquefaction of helium. Olszewski considered helium might possibly prove to be a permanent gas, considering that it is much more difficult to liquefy than hydrogen. About that time Professor Dewar suggested that they might prove to possess about the same degree of volatility, just as is the case with oxygen and fluorine.

Passing on to the last property of liquid hydrogen that has so far been determined, the lecturer remarked that the density of the liquid hydrogen must be in excess of the theoretical values, viz., about 0.18 or 0.12, reduced respectively from considerations respecting the atomic volume of gaseous compounds and the limiting density found by Amaget for hydrogen gas under infinite compression. Many years ago the professor himself had determined by experiment the density of hydrogen in palladium at 0.62 for the combined substance. It remains to be proved what is the real density of liquid hydrogen at its boiling point. But the boiling point has not yet been determined with accuracy. In conclusion, and speaking more generally, Professor Dewar went on to say that all the so-called permanent gases have now been condensed by the aid of manipulative skill at atmospheric pressure in spite of doubts on the subject expressed by so renowned a physicist as Clark Maxwell. The fact that at last we have arrived at a temperature within 20° or 30° of absolute zero opens up quite a new field to scientific enquiry and investigation, for the problem of the near future will be to find out the properties of matter at absolute zero It is historically interesting to note that Faraday in 1823 liquefied the first gas, viz., chlorine. Sixty years later air was liquefied by Wroblewski and Olszwski, and now in 1898 the last two gases to resist liquefaction, viz., hydrogen and helium, are obtained as astatic liquids. Assuming, in a thermodynamic sense, the gap bridged over between the liquefaction of chlorine and air to be the same as that between the liquefaction of air and hydrogen, we may take it as an index of the rapid rate of scientific progress at the present day in that the latter was accomplished in one-fourth the time required by the former. But this result must have been long delayed but for the engineering skill which Mr. Lennox has brought to bear on the problem, together with the manipulative ability and loyal perseverance of both Mr. Lennox and Mr. Heath.

In the discussion that followed, Sir William Crookes, Sir J. Crichton Browne, Sir Edward Frankland, Mr. Ludwig Mond, and others expressed their admiration of Professor Dewar's achievement. They all concurred in congratulating him and his assistants on this fine piece of work. Like Alexander, said Sir Edward Frankland, there remained no worlds for him to conquer. Lord Rayleigh testified to having seen the first droppings of this interesting liquid, and said that, from the little he had seen of it, there was no doubt in his own mind that the liquid was hydrogen.

Professor Ramsay questioned the purity of the sample of helium operated upon, and mentioned that, in 1895, Professor Olszewski had written him a personal letter, conveying the information that he had obtained liquid hydrogen. It would be interesting if Professor Dewar corroborated the determinations of critical and boiling points made by Olszewski. In reply, Professor Dewar warmly repudiated the suggestion that hydrogen had been liquefied by Olszewski, and called upon Professor Ramsay to produce the letter in public.—*Phar. Jour.*

Pills with Woolfat as Excipient.

The viscosity of woolfat makes it a very desirable aid in the formation of pill masses. These pills remain plastic, contrary to those prepared with wax and oil, soften readily between the fingers, and disintegrate at the temperature of the body. Mercurial pills: Concentrated mercurial ointment (75 p.c.) 10 Gm. (155 grains), powdered althea root 6 Gm. (92 grains), to make 75 pills. Each pill contains 0.1 Gm. (1½ grain) of mercury. The mercurial ointment consists of mercury 75 p. c., woolfat 18.75 p. c., liquid paraffin 6.25 p.c. Pills of silver nitrate: Silver nitrate 0.3 Gm. (4½ grains), cacao butter 3 Gm. (45 grains), woolfat 0.3 Gm. (4½ grains), to make 30 pills. Each pill contains 0.01 Gm. (one-seventh grain) of silver nitrate. The pills have a yellowish-white color, which they retain longer than is usually the case, since a reduction of silver does not take place, when the salt is not dissolved in water, as frequently done. Calomel pills: Calomel 3.6 Gm. (55 grains), cacao butter 4 Gm. (60 grains), woolfat 1 Gm. (15 grains), to make 60 pills. Each pill contains 0.06 Gm. (9-10 grain) of calomel. Potassium iodide pills: Potassium iodide 15 Gm. (230 grains), magnesium carbonate 1 Gm. (15 grains), cacao butter 5 Gm. (77 grains), woolfat 2.5 Gm. (40 grains), to make 30 pills. Each pill contains 0.5 Gm. (8 grains) of potassium iodide. Toothache pills: Powdered opium 1 Gm. (15 grains), powdered belladonna root 1 Gm. (15 grains), powdered pyrethrum root 1 Gm. (15 grains), oil of cajeput 3 drops, oil of clove 3 drops, yellow wax 1.5 Gm. (23 grains), woolfat 0.5 Gm. (8 grains), to make 100 pills. (Ap. Ztg.)