past. Although my head work is double what it was, it is now done with dispatch and pleasure as compared with the misery of a few weeks ago. I am much indebted to Dr. E. Cutter, of New York City, who gave me much encouragement and advice in pursuing this simple and, I believe, reliable treatment.

This is not a medicine to cure one complaint by bringing on another. It regenerates the whole system and makes the body a fit dwelling place to live in. Now, for the benefit of the sick poor, I have set up quite a plant in my shop, which makes about forty gallons per day, and it gives me much pleasure to say that this is entirely free to physicians for the sick poor who are prostrated with sickness. There is no doubt in my mind but that this simple, safe, and inexpensive treatment will cure dyspepsia, rheumatism, and gravel and possibly many other complaints.

There is one suggestion that seems proper to make in this connection, which is that there is a wide difference between the pure distilled water which I have used and condensed steam. One is pure and sweet, the other is unpalatable and impure.

It is also suggested that persons who take up this method should be reasonable, and not expect to be cured in one night, or even one month, of a trouble that has been fastened to them for years. Better conclude to follow it for six months; that would be reasonable.—A. J. Chase.

PROFESSOR AUGUST WILHELM HOFMANN.

AUGUST WILHELM HOFMANN, whose seventieth birthday was lately celebrated in Berlin, was born at Giessen. His father was an architect. He had the great advantage of studying chemistry directly under Liebig, and afterward of being engaged for some years as that chemist's assistant. In 1845 he took his doctor's degree with a treatise on the "Chemical Researches on the Organic Bases of Coal Tar." He then removed to Bonn as a private teacher, but a few months later, on the recommendation of Liebig, was appointed professor to the Royal College of Chemistry, in London.

This college, which was afterward absorbed into the School of Mines, was the school of many of our modern English chemists, who all remember Hofmann as a teacher with enthusiasm.

In 1862, at the request of the Prussian government,

PROF. AUGUST WILHELM HOFMANN.

Hofmann planned the famous laboratory at Bonn, and later on, a somewhat similar one at Berlin. He was asked to accept the directorship of either, and, having accepted that of Berlin, he left England and resumed his residence in Germany in 1865. During his residence in England he was elected a Fellow of the Royal Society in 1851, received the Copley medal in 1854, and was chosen president of the Chemical Society in 1861. He reported on the chemical sections of the exhibitions of 1851 and 1862, and was a member of the juries of both of these and of several other exhibitions abroad. He has written numberless treatises and papers on all branches of chemical science. He led the way in the aniline investigations which have given a vast new industry to the world, and more than any other he has contributed to an acquaintance with the formation of alkaloids. Cyanides, phosphides, bromides, sulphides, coniine, pyridine, piperidine, toluidine, and many other substances like these, keys to modern chemistry, have been worked upon with remarkable results by Dr. Hofmann. His popularity as a teacher in Berlin is attested by his class of 400 students, who listen fascinated to his two hours' lectures. Age seems to have no effect upon him. He is as active, as energetic, as exact in his experiments as he ever was, and as well up in the latest developments of chemistry as the youngest and most enthusiastic of its teachers or students. On the occasion of his birthday the Emperor Frederick conferred upon him a patent of nobility entitling him to the use of the coveted "von" in future, and the Empress Victoria and the Queen of England sent him their portraits handsomely framed. The governing body of the German Chemical Society presented to him in the course of the day a congratulatory address, signed by Sir Frederick Abel on behalf of the chemists of Great Britain, by Signor Cannizzaro for those of Italy, and by Mr. Wolcott Gibbs in the name of the servants of the United States, and accompanying the address were a marble bust of the professor and a sum of 30,000 marks, to be devoted to the foundation of a Hofmann Institute. Among the subscribers to the projected institute are many Englishmen, Italians, French, and Russians, besides Germans and Austrians. Professor Hofmann likewise received a large number of congratulatory telegrams, addresses, and diplomas from scientific societies and corporations at home and abroad.—*Chemist and Druggist*.

A NEW METHOD FOR THE SEPARATION OF TIN FROM ANTIMONY.

By H. N. WARREN.

THE slags, essentially a silicate of iron, containing, besides notable quantities of tungstic oxide, traces of lead, copper, and titanite oxides, are treated by the following method: After careful grinding of 2 grms. of the slag, the portion is at once introduced into a platinum dish, and treated with an equal mixture of pure hydrofluoric and hydrochloric acids. The whole portion of the slag, after digesting for a few minutes, is entirely decomposed, the greater portion of the SiO_2 being volatilized as SiF_4 , the remainder passing into solution and containing besides the whole of the tin as SnCl_2 , besides other impurities. The solution, after being filtered, is gently heated and saturated with SH_2 , the whole of the tin, besides the impurities present, being precipitated as sulphides. The precipitate collected is boiled with NaHO , to separate the bismuth and cupric sulphides present. The solution now contains pure sodio-sulpho-stannate of antimony and tin, which is reprecipitated by the addition of HCl . The antimony and tin sulphides now obtained are decomposed by means of aqua regia, and contain a large excess of HCl , both of which pass into solution as antimonious and stannous chlorides. The solution evaporated to a small bulk, to deprive it of any large excess of HNO_3 that may be present, is diluted with a moderately weak solution of HCl . To the acid solution obtained an excess of potassium ferrocyanide is added, and the solution—which should now possess a clear blue color, provided sufficient K_4FeCy_6 has been added—is allowed to boil. The whole of the tin is thus precipitated as stannous ferrocyanide, being insoluble in an acid solution, and, as there is no such compound as antimonious ferrocyanide, the antimony consequently remains in solution (which may afterward be precipitated by SH_2 and estimated in the usual manner). The precipitate containing the tin is now dried and ignited, a few drops of HNO_3 being added, which speedily destroys the organic matter present. The residue is now introduced into a crucible provided with a tubulated lid, and reduced by means of hydrogen or coal gas, allowed to cool, and dissolved by means of HCl . The tin precipitated as sulphide, oxidized with HNO_3 , and determined by the usual method.

The analysis and separation of tin from antimony in alloys may be conducted by precisely the same method, save that the alloy is dissolved by means of aqua regia in place of $\text{HCl}+\text{HF}$.

The precipitated antimony sulphide, after the separation of the tin by means of K_4FeCy_6 , should possess a bright reddish-orange color, entirely free from any brown coloration.—*Chemical News*.

ON A FREEZING MIXTURE.

By I. A. BACHMAN.

THE most commonly used mixture for obtaining, on a small scale, temperatures between -20° and -40°C . is that of snow and commercial hydrochloric acid. Since diluted sulphuric or nitric acid can be similarly used, it was thereby suggested that we might utilize for this purpose the mixture of equal volumes of strong nitric and sulphuric acid which had been employed in a Grove battery and for which we had little further use, frequently throwing away much of it. When first made, the mixture of acids has a specific gravity of about 1.63, and when spent about 1.57.

Mr. Bachman undertook to ascertain in what mixture this spent acid can be best employed for obtaining a freezing mixture. The temperature of the atmosphere in which the trials were made ranged from -2° to $+2^\circ \text{C}$., and in each instance the acid was brought to the temperature of the air before mixing with the snow. Diluting the acid with differing amounts of water and mixing these with snow, it was found that the undiluted acid and that diluted with one-tenth of the volume of water gave equal diminution of temperature. Any large addition of water lessened the cooling effect.

The following results were obtained:

100 c.c. acid and	225 grammes snow	gave fall of	31°C .
100 " " "	285 " " "	" " "	32°C .
100 " " "	340 " " "	" " "	30°C .
100 " HCl	200 " " "	" " "	30°C .

As there was so little difference in the result when the snow was used within so wide limits, it was found most satisfactory to mix the snow with the acid until it attains the consistency of a thin mush, thus dispensing with all weighing. It is to be noted, as is explained by the above, that when the snow is wet, the temperature to be obtained with it is almost as low as when it is dry, which is far from being the case when hydrochloric acid is used.

It will also be seen from the above figures that when working at a temperature near zero, the "spent acids" answer as well if not better than hydrochloric acid; but when endeavoring to obtain lower temperatures than -30°C . by previously cooling the acid, it was found that better results were obtained with hydrochloric acid.

I will add that when snow is not available I have found satisfaction in employing shaved ice for this purpose.—*Amer. Chem. Jour.*

DETECTION OF ADULTERATED GROUND BONES.

GROUND bones are frequently made from bones that have been deprived of their gelatine by boiling. In this way the nitrogen is lowered, and the phosphoric acid unduly increased. To remedy this the manufacturer often adds scraps of hoofs and similar nitrogenous matters, and at the same time he puts in sand or gypsum to bring the amount of the phosphoric acid within normal limits. The author has applied a similar process to that employed for the detection of alum in flour, viz., by shaking the suspected sample up with chloroform. When this is done the genuine bone powder sinks to the bottom, while the spurious additions float. No genuine sample of ground bones will show more than 5 per cent. of floating particles.—*E. Heiden, Chem. Zeit.*

ON THE REMOVAL OF ARSINE FROM HYDROGEN SULPHIDE.

FOR the purification of hydrogen sulphide made from the ordinary reagents, O. Jacobsen recommends passing the gas over some solid iodine before it is washed with water. This method is based upon the well-known facts that arsine and iodine react violently at the ordinary temperature, forming arsenic triiodide and hydroiodic acid, while hydrogen sulphide does not act at all upon iodine in the solid state or dissolved in strong hydroiodic acid. Experiment showed that 2 to 3 grammes of iodine were sufficient completely to purify a current of hydrogen sulphide made from the ordinary reagents, and running uninterruptedly for a day. The iodine is coarsely powdered, dried in the air, and then placed in a comparatively narrow glass tube, 30-40 cm. in length, a layer of glass wool being put at each end. In chemico-legal examinations, it is recommended that a second shorter tube containing some iodine be introduced, and that after the analysis this be sealed and put aside. If it can be shown that the iodine in this second tube contains no arsenic, evidence will thus be furnished that the hydrogen sulphide used was pure. It is not advisable to dry the iodine thoroughly, as the reaction is aided by the formation of a thin layer of a solution of iodine on the particles of iodine. If it is desired to purify hydrogen, this should first be passed over iodine as above described, then over glass wool which is moistened with a concentrated solution of potassium iodide, and finally washed with caustic potash.—*Berichte der deutschen chemischen Gesellschaft*, 20, 1999; *American Chemical Journal*.

BOWLERS IN COAL SEAMS.*

By Mr. W. S. GRESLEY, Assoc. M.I.C.E.

MR. VAUGHAN CORNISH having delivered an address illustrated by numerous diagrams on the "Artificial Reproduction of Minerals and Rocks," in which he showed the principal methods which had been employed in this kind of work, the meeting was devoted to the consideration of the question of the occurrence of bowlders in coal seams. A short communication was first read from Mr. Woodward, describing three bowlders found in the Trencherbone Mine at the Newtown Collieries, at depths of 950 to 1,000 feet below the surface, twenty or more being found in an area of 1,000 square yards. One of the bowlders had a groove in it, and another was of rather more quadrangular shape than is usual.

A paper by Mr. W. S. Gresley, Assoc. M.I.C.E., F.G.S., on "Bowlders in Coal Seams," was then read by Mr. Mark Stirrup (in the absence of the author). Mr. Gresley stated that the paper was intended to supplement certain references made in a recent paper read by Mr. Stirrup. Dealing first with bowlders taken out of the coal seams or from the overlying beds, they found that Phillips mentioned in 1855 the finding of a bowlder composed of quartzite or hard sandstone in a coal bed near Newcastle-on-Tyne. In the museum of that town there was a group of small bowlders (some being pebbles), among which was one from the "Main" seam—probably the lowest workable seam of the upper coal measures of Durham—at Cockfield Pit. Another one came from the top of the "Three-quarter" seam at Lands Pit. The composition of all these stones seemed very similar, viz., gray quartzite, and they were all well rounded. In the quarries of Messrs. R. Kell & Co., near the same town, a rounded foreign pebble was found last year. It occurred in the center of a large block of stone, at a depth of 15 feet from the surface of the bed. A large piece of transported rock of volcanic origin, 17 inches by 15 inches by 12 inches, had been found near Burntisland, in Fifeshire, embedded in the carboniferous strata, but it had the aspect of a bomb rather than of a bowlder. Again, at Oakesthorpe Colliery, Derbyshire, a layer of well-rounded bowlders and pebbles was seen in 1855. The bowlders lay on the top of the seam, in a lenticular patch of shale, which took the place of the regular sandstone roof. This instance was mentioned because the matrix of the pebbles was shale, which had probably replaced the sandstone, and it was an interesting and curious discovery. In North Wales a pebble had been found in the Rydegale mine, and in 1862 a rounded piece of white quartz found in a bed of coal was exhibited, which came from a mine near Church. In 1865 large rounded quartz pebbles were reported in shales and ironstones lying near the base of the upper thick measures at Apedale. They were in the middle of the coal measures of that coal field, which were about 6,000 feet thick.

In April of last year, bowlders were found at Worthley in an overlying coal bed. They occurred at about 30 feet below the surface, and the largest, which was coarse gritstone, measured 2 feet 6 inches by 2 feet, had a smooth surface with slight striae, and was found in the shale just over the coal seam. The others were much smaller in size, and were all embedded in the coal itself. In a Shropshire colliery a water-worn pebble, of lead ore, was taken from the top of a coal seam in the workings. Two years ago he (Mr. Gresley) obtained a smooth, flat quartzite pebble from the middle of the "Roaster" coal, at Heather. The pebble lay at 12 inches from the top, and appeared to contain worm burrows. In 1883 a group of much larger stones was discovered at the same mine completely embedded in the coal, while 500 yards away a bowlder of similar character was found in the same coal. A layer of water-worn quartz pebbles was found on the top of the coal at the Clifton coal mines, Queensland, 80 feet from the surface.

New Zealand had also furnished very similar pebbles. He might also refer to the occurrence, in South Wales, of pebbles composed of cannel coal, met with in the roof of a seam of ordinary coal. In the Kanawha Valley, West Virginia, it was stated in 1881 that in a sandstone roof in one place where a fall of roof occurred, exposing a section of sandstone, a number of blocks of coal, embedded in rock, were shown. They were not stringers or layers, but angular blocks of splint (hard, dull-lustred, coarse fibrous pure coal), as well defined as though they had been picked off a coal car and placed in the sand while it was being deposited. In the same year the manager of the Moira colliery, Leicestershire, noticed a large, angular, rugged block of coal, completely enveloped in the floor of the seam, measuring

* Abstract of paper read before the Manchester Geological Society, April 10, 1888.