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THE HYDRAULIC ANNEXE AT THE CENTENNIAL EXPOSITION.

There are few more attractive features in the Exposition than the wing or annexe of the Machinery Hall which is devoted to the display of the hydraulic apparatus. Long before the locality is reached the sound of "the rushing of mighty waters" reaches the ear, drowning the clatter of the vast area of mechanism in the vicinity; and the eye is greeted by a score of great streams, first curving majestically into the air, then lashing the waters of the huge tank below into spray; while in rear of all, a moving background of crystal and foam, falls the grand cataract. From a point behind this superb sheet of water, our artist prepared the drawing from which the annexed engraving was made. The tank is an immense brick and cement basin 146 feet long and 60 feet wide, the bottom being 8 feet below the floor of the Hall. With the water level 14 inches below the floor, it contains nearly 500,000 gallons of water, which is used over and over again in the pumps, and drawn off only when it becomes foul and unfit for use, when a new supply is let in from the mains.

At the south end of the basin is the apparatus for testing turbine wheels, and this includes the miniature Niagara already referred to. Upon six columns, three of which are supported upon an oblong pier, erected within and near the end of the reservoir, and extending across it to within about 4 feet from each side (the other three resting on foundations within the basin) is placed a tank of boiler iron 36 feet long by 18 feet 6 inches wide and 5 feet 6 inches deep. On the side of the tank, overhanging the reservoir, is a weir overflow of the proper curved form, extending the whole length, and placed about 32 feet above the level of the main tank: by means of which weir, measurements of water discharged may be made. It holds about 19,000 gallons. The water falls over the weir into the tank in a single magnificent sheet, at the rate of 30,000 gallons per minute. This supply is maintained by two Andrews' centrifugal pumps of 100 horse power each, which are able to fill the tank every 38 seconds and to empty the main reservoir in 16½ minutes. The elevated tank also serves to obtain a head under which other pumps may discharge while under test. From the bottom of it is led, directly downward, a penstock tube 4 feet in diameter, and immediately under it is a cylindrical chamber of brick and cement 8 feet in diameter, built in the foundations of the tank columns. In this chamber the water wheels will be placed.

Ranged along the sides of the main reservoir are numerous hand and steam pumps of all sizes, grades, and patterns, the steam apparatus having delivery pipes measuring from 1 inch to 12 inches in diameter. These pipes are represented in the engraving at about 12 feet from the floor, and projecting over into the tank. At the north end of the latter a crane pump throws a 2 inch stream of water almost to the opposite extremity. Numerous tests of the hydraulic machines are to be conducted; and the results, it is believed, will prove of great value towards determining the economy and merit of the various apparatus for raising water and producing power.

A GOOD bell metal consists of copper 100, tin 20 parts.

Bodily Weight and Nutrition.

Professor C. Voit, in a lecture at the Public Health Congress held at Munich, remarked: "The weight of the body has often been assumed as an infallible proof of the maintenance of the condition of the body, or of a deposition of tissue, and the food which keeps up a man's weight has been regarded as on that account satisfactorily nutritious. But the weight of the body is no criterion of the value of the food taken, because while the weight remains constant, or even increases, water may increase in the tissue and albumen and fat diminish; or there may be an increase of weight and deposition of fat, while there is also at the same time a diminution of the albumen of the body. Badly nourished people are usually not lighter than others, but their bodies contain more water and less albumen and fat than those who are well nourished. Every cattle feeder knows that cattle which are being fattened do not at first increase in weight

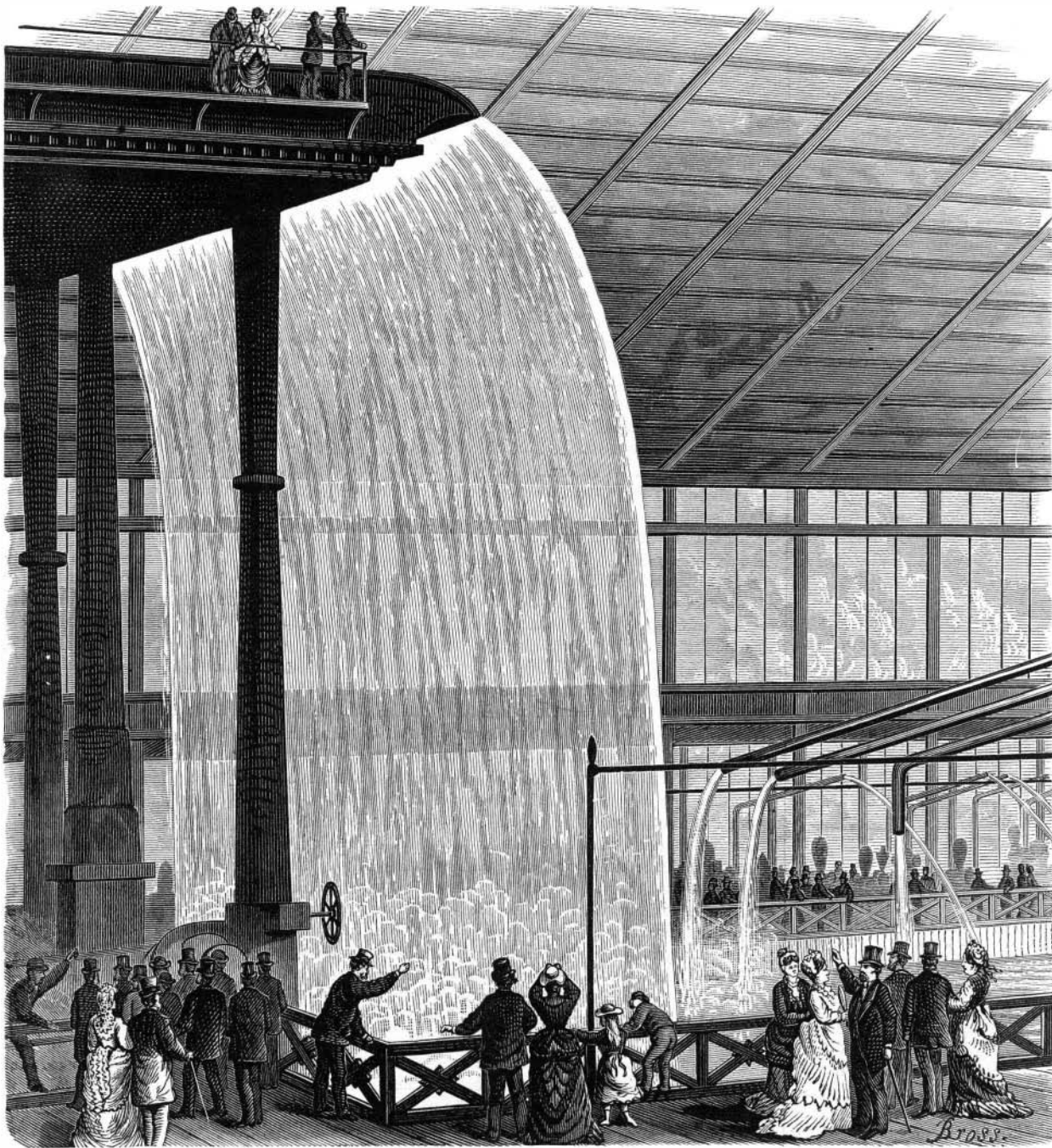
very large yield is predicted; and owing to the proximity of the bed to the railroad, the expenses of transportation will be small.

The Universal Distribution of Chromium.

With regard to the new mineral claubretite, which has lately been observed in meteoric masses, Professor J. Lawrence Smith considers it to be a photosulphide of chromium, of the composition: sulphur, 37.62; chromium, 62.38. This, taken into consideration with the revelations of the spectroscopy regarding the vapors which surround the sun, shows that chromium is largely diffused through the material of the Universe.

Experiments with Frozen Dynamite.

Some interesting experiments were recently made at the works of the British Dynamite Company at Stevenston, Ayrshire, with the view of proving that dynamite in a frozen state is as safe to handle and to transport as in an unfrozen state. Professors James Thomson and Bottomley, of the University of Glasgow, were present. In the first experiment, several cartridges, in a frozen state and in some parts beginning to thaw, were thrown one by one from the hand, with great force, against an iron plate without explosion. In the second experiment, a block of iron, of about 400 lbs. weight, was allowed to fall from a height of about 20 feet on a light wooden box containing 20 lbs. of dynamite cartridges in a frozen state, and with slight signs of incipient thawing in spots more exposed to the warmth of the air. The box was smashed, and the cartridges were crushed flat and pounded together, but there was no explosion. The crushed cartridges were next made up into two heaps to be exploded. The ordinary detonator shatters but does not explode the frozen dynamite. The explosion was therefore effected by inserting in each heap a small unfrozen cartridge, with the ordinary detonator inserted into it, and then firing this off by a Beckford fuse. The two heaps were exploded successively, and it is worthy of remark that the explosion of the first, though very violent, did not set the other off, the unfrozen cartridge being the only means for effecting



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proportionately to the food they take. And yet people commonly regard weight as of great importance in the case of men, though a butcher will not buy a carcass on the merits of its weight alone; he must know the quality of the meat.

"The subjective feeling of satisfaction is equally deceptive. The Irish peasant who consumes ten pounds of potatoes in the day feels quite satisfied, and yet is badly nourished. The bad effects of an improper dietary are often seen only after a considerable period has elapsed."

New Sulphur Mines in Nevada.

A new and extensive sulphur bed has recently been discovered in Washoe county, Nevada. The sulphur is imbedded in a light colored formation similar to steatite, which is half a mile in width, and can be traced north and south for about a mile. The mine has been opened to a depth of some 20 feet, and the sulphur is abundantly met with in the shape of crystalized bunches. It assays about 75 per cent of the pure article, and is worth \$50 a tun in San Francisco. A

this purpose.

Poisons.

On April 21, the Austrian government published a decree in regard to the traffic in poisons, declaring the following substances to be included under the term poison: 1. Arsenic and all its compounds. 2. Chlorides and oxides of antimony. 3. Oxides and salts, including the chlorides, iodides, and bromides, of mercury. 4. Ordinary phosphorus. 5. Bromine. 6. Prussic acid, and preparations containing it, as also all cyanides, with the exception of those containing iron. 7. All violently active preparations made from poisonous plants and animals, or manufactured artificially, such as the alkaloids, curare, cantharides, etc.

PARAGUAY TEA.—We learn from the *Deutsche Industrie Zeitung* that Paraguay tea (*mate*) has recently been introduced into two cafes in Vienna, and has already found many admirers.