



THE GREAT EXHIBITION AND WHAT MAY BE THERE SEEN.

LONDON, August 5, 1862.

The great sight of London at present is of course the "Exhibition," which certainly far surpasses any expectations I had formed concerning it. The exterior of the building is plain and rough, but the interior is extremely tasty and beautiful. The general plan of the building is rectangular, 800 by 700 feet, crossed by naves and transepts, with two domes of glass, the largest hitherto constructed, viz., 250 high and 160 feet diameter. There are then, in addition, two wings or "annexes," as they are called, one 975 feet long and 200 feet wide, and the other about 800 feet. The galleries, if placed in a straight line, would extend a mile and a half, and all of this immense space is full to overflowing. If you ask me what there is decidedly new and original, I should answer, little; but, as an exhibition illustrative of the world's progress, and of the excellence attained in every branch of science and art, it is as near complete as it is possible to make it. In the machinery annex, I did not notice a single machine which struck me as involving any decidedly new thought. Many of the wood-working machines, with which we in the United States have been long familiar as the "last-turning machine," "variety-molding machine," and others, are exhibited as new, and the English and foreign exhibitors, moreover, have received medals for them as new mechanical achievements. India rubber, of course, figures largely; then there is diamond cutting and polishing, by an old and simple plan, of an iron revolving disk and diamond dust, which interested me much; the manufacture of ice, by two exhibitors, who deal out small cakes to a crowd of visitors, in the place of business cards; Jacquard looms, which weave small portraits of the Queen (also sold on the spot), &c., &c. The exhibition of steam engines and locomotives is very fine, and in excellence of workmanship is far superior to anything I have ever seen on our side of the Atlantic. One of the great marine engines, built for a monster iron-plated frigate, now in course of construction, is shown, so arranged in pieces that the visitor may inspect every portion, and, at the same time, see its relative connection with every other part. It is in such work as this that an American feels that the English have no superiors. There are no ornamental "fixings," but everything about these engines seems adapted for hard, continuous service. And I also remarked this, that machines of American invention, built in England, are better pieces of workmanship than their originals. An English mechanic seems to never use a piece of wood if he can make iron available, and although the first cost must be greater, the machine in the long run is probably cheaper. I was also much interested in an exhibition of samples of all the marine telegraphic cables (entire and in sections), laid down in various parts of the world, some of which have been eminently successful and others failures, and in "Bonelli's electric loom," "Bonelli's electric telegraph," by which an exact *fac simile* of any writing or drawing is transmitted, and in two practical adaptations of the electric light to light-house illumination, one English and the other French. In the first, the light was produced by revolving magnets, arranged on a wheel three feet in diameter, driven by a two-horse power engine. The light was very steady and brilliant, and the plan has now been in actual operation at the South Forelands light-house, under the direction of Prof. Faraday, for over a year. It would seem likely to be universally adopted. The French light was, for some cause, imperfect.

Of warlike implements there is no end, the British Government leading off in the display, and every European nation following except France which sends nothing in this line. The heavy guns exhibited by the British Government are all breech-loaders, mostly of the Armstrong pattern, and this breech-loading system characterizes all of the guns sent by the continental workshops except Spain, which, in common with France, has neglected it. The British guns are

of splendid workmanship, and the 10-inch are more massive than the American 10-inch, but there is a complication about them which does not auger well for service. By the side of these guns lie portions of the iron targets which have been used by the government commission in experimenting with the Armstrong and Wentworth guns and very thoroughly have they been smashed and penetrated. As the range at which these results have been arrived at was small the inferences are of little value.

The display of jewelry, of work in the precious metals and in ivory carvings, enamels, &c., is probably the finest and most extensive the world has ever seen. Most curious in this line are the things carried off from the Chinese Emperor's summer palace at its sacking three years ago by the combined French and English armies. It was said that the English did not have their grab until the French were satisfied, and that the former obtained comparatively little. If this is so one naturally wonders after seeing the specimens of the English plunder what the French must have in their possession. Among the objects exhibited in the Exhibition from the palace, in addition to whole cases filled with miracles of ivory and wood carving, enameled vases, porcelains, silks, &c. there is a string or necklace of pearls, said to be the most perfect in the world. Each pearl is about the size of a small filbert, perfectly round and without the slightest imperfection, and all so nearly alike in size that the eye can distinguish no difference between them; their value, including a few diamonds at the ends of the necklace, is estimated at \$50,000. There is also a cup, the bowl of which consists of half of a human skull, inlaid with diamonds and emeralds and mounted upon a massive and sculptured gold stand over a foot in height. The costly screen which stood behind the throne is also here.

Across the nave fine specimens of the plunder of India are exhibited, including the great Koh-i-noor diamond and its two smaller companions, and the two largest rubies in the world. These last were taken during the recent war from the treasury of Lahore and were formerly worn by the Mogul Emperors. They are each about the size of a large walnut and form the pendants to a diamond necklace of about 20 stones, these latter being of the size of small filberts. In an adjoining case a French exhibitor shows the largest and finest sapphire in the world, measuring, I should say, 3 by 2½ inches, and without a flaw. Elsewhere one may see the largest and finest known emerald, oriental amethyst, the supposed largest cat's-eye and a pearl nearly an inch in diameter. The French also make a most curious exhibition of artificial gems and pearls. One exhibitor shows two sets of pearls, one real, worth £4,000 (\$20,000) and another false, worth £40 (\$200), and defies any person to distinguish, by sight alone, between the two. The false gems are exhibited in every stage of manufacture, from the mass of composition in the crucible to the cut and set stones. Here, again, the eye is completely at fault, the taste of the manufacturer leading him to discard all extravagances, the more completely to deceive. The price of these fictitious gems is however very high.

The display of porcelain and glassware is very extensive and wonderfully fine. The French Government sends from the Sevres works about 500 pieces, Dresden and Bohemia occupy a large space. One however, is little prepared for the show made in this department by the English manufacturers, who certainly equal, if they do not surpass, the finest French work. I am told that the advance made in porcelain and glass fabrication during the last ten years is greater than in any other branch of manufacture. What say you to an English dinner service, every plate of which is worth ten guineas (\$50)? Or to a glass jug or vase, covered over with the most beautiful lace and cameo-like cutting, for £250 (\$1,200). Most of these beautiful articles are marked sold, and this fact continually impresses you with the consciousness of the immense wealth which must exist in Great Britain, to enable such fabulous prices to be continually paid for objects which the slightest accident would render valueless, and which have little or no practical value. In the case of the glass vase or jug aforementioned, a sale was effected the very first day of the Exhibition, and the purchaser, who paid £250, was afterward offered £500 (\$2,500) for his bargain and refused it.

You are aware that the present Exhibition, unlike the former one of 1851, includes a gallery of pictures, the finest art treasures of the kingdom having been freely lent by their possessors. Of the number of these I will only say that the walls of the various galleries are nearly 30 feet high (the pictures being hung four and five deep), and in their entire length measure over a mile. I have spent two entire days but did not get a fair sight of half of them.

D. A. W.

Rotary and Piston Steam Pump—Throwing Water.

MESSRS. EDITORS—On page 134, current volume of the SCIENTIFIC AMERICAN there is a letter from Ottawa, C. W., in regard to streams thrown from rotary pumps. The writer's views are entirely different from my experience. I have had a great deal of experience with steam fire engines, both piston and rotary, and have repeatedly seen engines of the same build of boiler—the one with a rotary pump and the other with a piston pump—tried side by side with the same length of hose and diameter of nozzle, both having water and steam gages, and I have almost invariably found that with the same water pressure the rotary throws one quarter further than the other. On comparing pressures it will be found that up to about 40 lbs. of steam the rotary has the most water pressure; at 50 lbs. they are about equal, and at 60 lbs. the piston begins to go ahead. When the water pressure of the rotary arrives at 100 lbs. pressure, it seems to have about reached its limit. I have known one rotary, however, to get 140 lbs. water pressure on, but I have seen a piston pump run it up to 360 lbs.

There seems to be a limit to the useful pressure in throwing a stream of a given diameter. This seems to be for a one-inch stream about 70 lbs., and the distance 250 feet; for an inch and a quarter stream the pressure is not far from 160 lbs., and it can be thrown about 280 feet.

It takes much more pressure than is generally supposed to throw water through a long line of hose. To deliver 300 gallons per minute through 1,500 feet of hose, requires a pressure from 180 to 300 lbs., depending on the kind of hose and the manner in which it is laid.

M. B. B.

Toledo, Ohio, August 26, 1862.

To Preserve Peaches.

MESSRS. EDITORS:—Procure glass jars with the Willoughby or Bodine & Brother's Patented Stopper, or any other simple and effective stopper, select good solid peaches, pare and take out the stones, take one pound of the parings, one pint of water, half a pound of white sugar, boil well together for forty minutes in a brass kettle, then strain through a cloth, let the sirup cool, fill the jars with the pared peaches, pour in the sirup until the jars are full. Take a convenient vessel, put a cloth in the bottom, set in the jars, then fill the vessel or the space around the jars with cold water, to come within three inches of the top of the jars, set on the stove, bring gradually to a boil, boil well for thirty minutes, take the jars out of the vessel, put on the stoppers, screw tight while hot. Peaches put up in this way will stay solid, and keep the natural color and flavor for any length of time.

M. HARBSTER.

Reading, Pa., August 28, 1862.

Big Guns.

MESSRS. EDITORS:—The 22-inch gun at Constantinople, mentioned in your last number, is not the largest in the world. The forts at Dardanelles mount 28, varying in diameter of bore from 25 to 28 inches. They are brass, with chambers. (Morse's *Gazetteer*, article "Dardanelles.") "Queen Elizabeth's Pocket Pistol," at Dover, a long Dutch gun of the 15th century, is said to have thrown its 12-lb. ball seven miles, which the *Edinburgh Review*, April 1859, page 263, considered not improbable.

MARSHALL S. BIDWELL, JR.

Monterey, Mass., August 26, 1862.

ANY substance in infinite division must of necessity be black, from its not having breadth enough to reflect a ray of light, which requires certain definite dimensions that philosophers have measured. Metals of all colors exhibit the same phenomenon; white silver, yellow gold and red copper may all be reduced from solutions in powder so fine that they are black.