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PLATINUM.

The price of platinum has recently advanced very greatly, until now it is nearly equal in value to gold. In July, 1889, the price was \$8 an ounce, six months ago it was \$14, and at this writing it is \$20 an ounce, while gold is quoted at \$20.70. This rapid rise in the value of the metal is due to the steadily increasing demand from the manufacturers of electrical apparatus. Every incandescent electric lamp requires about one inch of platinum wire, and nothing has yet been found to take the place of it. Large sums of money have been expended in the prosecution of experiments having for their object the discovery of a substitute for platinum wire in the manufacture of electric lamps, but without satisfactory results. In the Edison incandescent lamp the copper conductor is attached to a short piece of platinum wire as it enters the glass pear-shaped globe, and the platinum joins the carbonized bamboo loop. The reason why platinum is so indispensable is that that metal and glass expand at very nearly the same temperature. If this were not the case, and there was an unequal expansion from the heat of the lamp, the seal of the glass globe would be broken and the light soon extinguished. The history of this metal is most interesting, and its characteristics are very remarkable.

During the first half of the sixteenth century it was observed that the gold ore from the mines at Darien, in South America, included grains of a whitish metal which was deemed to be a noble metal, and yet it differed in a marked degree from silver. The fact of the discovery of this metal was not made known by the Spanish government, because they found that it furnished an excellent material for adulterating gold, and none of it was allowed to be exported. It was only at about the middle of the last century that the metal began to find its way into Europe, where it became known as a curiosity under the Spanish name of platina del Pinto (the little silver from the river Pinto). The principal source of the supply of platinum is from the Ural Mountains, but it has also been found in the provinces of Choco and Barbacos, New Grauada, and in Brazil. It occurs also in San Domingo, on the island of Borneo, in Honduras, among the sands of the Rhine, and in the County Wicklow, Ireland. It is also met with in California, at Rogue River, Oregon, in Rutherford County, North Carolina, and in Canada.

The Ural Mountain deposits were discovered about 1823, and they have been worked by the Russian government since about 1828. According to Daubre, the Ural ore was embedded originally with chrome iron in a serpentine derived from olivine.

Platinum ore is found in alluvial districts in the debris of the earliest volcanic rocks. It is generally found in small grains, but masses of considerable size have been discovered, and several of these have been preserved as curiosities. The Demidoff museum contains a native platinum lump weighing 21 pounds troy. Humboldt brought a piece from South America weighing 1,088 grains and having a specific gravity of 18.94 and deposited it in the Berlin museum. In 1822 a specimen from Condato was placed in the Madrid museum which was 2 1/2 inches in diameter and weighed 11,641 grains. When found in its native state, it is in rounded grains or nuggets, or in flattened scales worn smooth by attrition in the gravel of river beds.

On the northern coast of California, a mixture of gold and the platinum metals in extremely small scales is washed from the beach sand, and from this mixture the gold is removed by amalgamation.

From observations made of the rocks and minerals found with platinum in deposits, the theory has been formed that the metal is chiefly derived from the disintegration of serpentine rock.

Nearly all the native platinum is more or less magnetic. There were several specimens of this kind in the collection sent to the Paris exposition, in 1867, by Prince Demidoff, upon whose estate in Russia there are a number of places where large masses of the ore have been found.

Platinum was coined by Russia to the extent of \$2,500,000 between 1826 and 1864, when the coinage was discontinued.

Almost all platinum contains iridium, which greatly increases its hardness and durability without impairing its power of resisting chemical agents, and it has been termed the metal of the chemist. Liebig said that "without platinum crucibles, which share the infusibility of porcelain with the chemical inertness of gold ones, the composition of most metals could not have been ascertained, and chemistry could not have come to its present level." The unalterability of this metal at high temperatures, and its power of resisting the action of most chemical agents, makes it invaluable for crucibles, evaporating dishes, forceps, and foil for blowpipe experiments. One of its most important uses is for large evaporating stills for the concentration of sulphuric acid. A still of this kind valued at \$19,000, exhibited at Vienna in 1873, was capable of concentrating 20,000 pounds of sulphuric acid daily. A well known oil-refining company located in New York City paid \$24,000 for a still of this kind to be used in their business. The joints of these stills are autogenously

soldered, thus giving them entire uniformity of material, and making the whole vessel of one piece. It would not, however, be possible to produce such large homogeneous vessels without the aid of the blowpipe.

As early as 1837, Dr. Hare, of Philadelphia, proposed to melt platinum and he succeeded in melting 28 ounces into a malleable, homogeneous mass. M. M. Deville and Debray have conducted a number of successful experiments with platinum, so that ingots of large size can now be made.

Still another use to which platinum has been put is in the manufacture of jewelry. Its dull, steel-gray color prevents it from being ornamental in itself, but it is plated with gold, and large quantities of it have been used in this way. If the prevailing high price is maintained, however, platinum can no longer be used in this line of manufacturing. It is thought by some that the prevailing high price will stimulate the production of the metal in Russian fields, where large deposits are believed to exist.

NICKEL-STEEL PLATES FOR OUR WAR VESSELS.

The remarkably short time it took for Congress, after the final results of the recent trials at Annapolis were known, to make the large appropriation of \$1,000,000 for the purchase of nickel to be used in the manufacture of nickel-steel plates for armoring our war vessels is something phenomenal. The very great superiority of such plates over the English compound plates, such as used on most of the armorclads of the British navy, was so plainly shown at the trials as to admit of no question, but the superiority of the nickel-steel over the all-steel plates was by no means so decided, and there appears at first to have been some difference of opinion on this point. On the final trial, however, when only one shot was fired at the center of each of the plates from an eight-inch gun, the superiority of the nickel-steel plate was plainly demonstrated.

The projectile used was an English Firth shell weighing 210 pounds, the shell having a tempered point and a softer base than the 100 pound shells used in the previous trials. The first shot was fired at the all-steel plate, which the projectile penetrated into the oak backing, and rebounded, the shell being broken up. It had made in the plate a ragged orifice with splintered edges, and four narrow cracks radiated from the center hole to each corner of the plate, through the holes which had been previously made by the six-inch projectile. The next shot was at the center of the nickel-steel plate, which was penetrated, the shell burying its point therein, while the base of the shell was broken into small pieces and scattered in all directions. There were, however, no cracks in the plate, whose structure seemed to be uninjured except where it had been struck by the five different projectiles. The last shot, and the fifth on the Cammell compound plate, broke the latter all up, penetrating both plate and backing and scattering large and small pieces in all directions, while the projectile itself was apparently uninjured.

The result of these trials was to induce Secretary Tracy to make immediate application to Congress for the large additional appropriation, and it has been many years since a call for so large a sum for any similar purpose has met with so prompt and satisfactory a response. It is announced that the contractors for armor plates have consented to introduce the nickel alloy, without change of contract, into all plates already not too far forward in process of manufacture to prevent this, and thus it is seen that one advantage of the very first importance has been obtained by the deliberation and thorough care thus far manifested in the construction of our new navy. The armor plates used thereon will be far superior to those already in place on the armorclads of all present war vessels.

The question of alloying steel with nickel, to give greater strength, is not, however, a new one, for experiments in this direction have been conducted by prominent firms for some years past, both on armor plates and gun barrels. The amount of nickel used in the Creusot plate recently tested is said to have been three and a half per cent, but is by no means considered settled that this is absolutely the best proportion to use, and if it proves to be the best for armor plates, it may not be the best for other uses. It is safe to say, however, that the trials so successfully conducted at Annapolis will give a great impetus, not only to further improvements in armor plates, but also to a corresponding progress in the manufacture of guns and projectiles.

How to Sweep a Store.

We don't use a leaky old sprinkling pot to sop the floor all over in puddles when we sweep. No, sir! We have wet sawdust, and I put a row of it across one end of the store and sweep that right along to the other end, just like a regiment marching across a ten acre lot. It catches all the dirt and carries it along. If it gets a little dry, I add some more. Some folks scatter sawdust all over the floor, but Mr. Vanders says that's no good; that the reason for using sawdust is to avoid wetting the floor all over and to have something that will absorb the dust.—Com. Enquirer.