oxide of copper, and roasts it, till it takes up another equivalent of oxygen and is converted into black oxide. This is then boiled with linseed oil until it assumes its original pure color as sub-oxide; the oil so treated becomes a quick drying oil, and is capable of suspending a large amount of copper oxide.

In his plans for the anti-fouling composition, the author included the application of zinc plates inside and outside the hull of the ship to prevent oxidation from abrasion or other causes. There were numerous parts of iron ships of war which required chemical supervision, as not only should every metallic fitting electro-negative to the irons be insulated, but every piece of timber should be insulated, especially in the bilge; for when wood decayed in contact with iron and seawater, it produced sulphuretted hydrogen. Certain woods, however, were less liable to decay than others when in contact with iron, and among them were teak and stinkwood. In conclusion, the author alluded to the statements made respecting the foulness of the *Warrior's* bottom. He said that after she had been out of dock nine months she had no oxidation whatever on her bottom, although she was coated with the greatest expedition, it being then thought that her presence would be required in American waters.

Strength of Cast Iron Columns.

From the Practical Mechanic's Journal, June, 1863.

In an investigation on the strength of materials, Prof. Wiebe, of Berlin, is said to have arrived theoretically at the conclusion, that a solid round cast iron column is *weaker* than a solid round wrought iron one of the same dimensions; but a solid square cast iron column is *stronger* than a solid square wrought iron column of the same dimensions. Taken in all its generality, we doubt the possibility of such a result being correct.

On the Strength of Malleable Cast Iron. By M. TRESCA.

From the Practical Mechanic's Journal, June, 1863.

The malleable cast iron of M. Dalifol, of Paris, is made from mixed Scotch pig, and the tempering is effected by the castings being inclosed in crucibles filled with native iron oxide, and exposed to a very great heat. Experiments were made with four square bars, of from $\cdot6$ to $\cdot81$ metres length, and about 1, 4, 9, and 16 square centimetres sectional area, which were supported at the ends on sharp edges, and loaded in the middle. The smallest bar, $\cdot39$ of an inch square ($\frac{3}{8}$ ths full), and 1.87 feet long between the supports, showed, up to a load of 78 lbs., a regular increase in deflection of $\cdot0973$ inch for every 23 lbs., which gives a modulus of elasticity of about 12,600,000, the same as many good qualities of iron. The second bar gave a modulus of elasticity of 11,000,000; the third, 10,600,000; and the fourth, 10,800,000. Out of this last bar, 1.56 inches square was cut a fifth, only $\cdot351$ inch

piece as the former, and being .585 inch square, gave 9,860,000 as modulus of elasticity (equal to that of good cast iron). This shows that the iron is not wholly converted into malleable iron. A bar .195 inch square, showed a tensile strength of 50,600 lbs. per square inch, nearly as much as good bar iron.

Gauging of Water by Triangular Notches. By W. YEATES, C.E.

From the Civ. Eng. and Arch. Jour., June, 1863.

I was interested by the paper in the last number of your Journal, entitled "Experiments on Gauging of Water by Triangular Notches." On referring to page 361, vol. xxiv. of your Journal, there referred to, I observed that seven inches was the greatest depth on the notch in the angle; and that the only triangular notches experimented with were a right-angled triangle and a triangle with slopes of two to one. It appears to me that these experiments were too limited, and only of value as far as they go. Unless for admeasurement of small quantities of water, the triangular notch appears quite unfit for practical application, and any inferences made for long triangular notches from rectangular ones, of little practical value. Why not at once use the rectangular ones, on which the experiments are most extended? On looking at Mr. Neville's hydraulic formulæ and valuable collection of experiments, I find at page 55, second edition, that using the co-efficient .617, his formulæ for triangular notches become, when reduced for a right-angled notch $D = .317 h^{\frac{5}{2}}$, which corresponds with that given in the Journal; and he has pointed out the general approximate application of the co-efficient .617 to all sorts of orifices in thin plates, whether at the surface, as notches, or as submerged orifices, triangular, circular, polygonal, or mixed. The discovery of one general co-efficient of this kind is of great practical value, and supersedes any necessity for further experiments with small notches in thin plates.

Liverpool, May, 1863.

For the Journal of the Franklin Institute.

Vanderlyn the Artist and the Commissioner of Patents; or the Fine Arts versus the Mechanic Arts.

Shortly after the death of President Taylor, I spent an evening in Washington with Vanderlyn and the then Commissioner of Patents, at the house of a mutual friend. A portrait of the deceased President by V. had that day been disposed of by raffle. After expatiating awhile on Art and High Art, and giving incidents connected with the production of his famous pictures of Marius, Ariadne, Danae, Landing of Columbus, &c., the conversation slid into an amusing debate on the relative importance of the Mechanic and the Fine Arts, and on the social position of their professors. Vanderlyn was insulted at the comparison, and poured out scalding remarks on the ignorance and presumption that would raise the anvil and forge to a level with the pal-