

cal purposes, the author owns that other methods of forming it, besides those here suggested, might be contrived : but the general problem, he says, is to combine, in the most intimate manner possible, the greatest quantity of mercury with a given quantity of platina. And he adds, that the principal difficulty in resolving the problem will be to unite such a portion of mercury that the specific gravity of the compound may not exceed 12 ; and that it may be soluble in nitric acid.

In the course of this inquiry, many instances have occurred which show how much we have yet to learn concerning the nature of mercury and platina. Of the former, we know that it is perpetually varying ; and that certain solutions of it will frequently change their state in a few hours : and as to the latter, we are still more in the dark concerning its principal properties. A considerable part of the present paper is taken up in describing some experiments respecting these metals, from which we learn that platina will combine with oxygen, and form a true oxide ; that the affinities of platina differ much from what has generally been stated in the tables ; and that, in general, the whole doctrine of chemical affinities still offers a field for much investigation. The affinities of metals, which are here experimentally demonstrated in several instances, will, no doubt, serve to put us upon our guard concerning the admission of new simple metals, which, on close examination, will often, as in the present case of the palladium, turn out to be combinations of so close a nature as not to be easily decomposed. A great obstacle to the discovery of this deception is, no doubt, the little dependence that is to be placed on specific gravities ; since, as we have seen above, a contrary anomaly to that which operates upon platina and mercury may take place in other alloys, which in some cases become as much heavier than the mean as the palladium becomes lighter. In a word, the principal task of modern chemists seems to be to simplify and reduce the immense number of supposed elements ; and, by a close observation of nature, to learn from what a small store of primitive materials all that we behold and wonder at has been originally created.

*An Account of the sinking of the Dutch Frigate Ambuscade, of 32 Guns, near the Great Nore ; with the Mode used in recovering her. By Mr. Joseph Whidbey, Master Attendant in Sheerness Dock Yard. Communicated by the Right Hon. Sir Joseph Banks, Bart. K.B. P.R.S. Read April 28, 1803. [Phil. Trans. 1803, p. 321.]*

On the 9th of July 1801, this frigate sailed from Sheerness harbour with a strong favourable wind. In about thirty minutes she went down by the head, and in less than four minutes more she sunk entirely, twenty-two of the crew having perished by the fatal accident, which is ascribed to the hawse-holes being extremely large, low, and carelessly left open ; so that by the crowd of sail the ship bore, they were pressed under water, by which means she filled imperceptibly, and sunk before any preventive means could be applied.

In order to raise her, Mr. Whidbey had recourse to another Dutch vessel of 1063 tons burthen, and four lighters of 100 tons each. In what manner he slung the frigate through the ports, and across the decks, and by proper purchases and other expedients first overcame the powerful effect of cohesion at the bottom, and then having floated her brought her safe into harbour, and completely recovered her, can only be clearly understood by perusing the paper, and at the same time inspecting the drawing which accompanies it. Mr. Whidbey, at the end of his paper, acknowledges that he does not apprehend that there is anything new in the mode he has adopted in weighing this frigate, unless it be the expedient he had recourse to in order to remove the effect of cohesion : and he declares his opinion, that if a similar principle had been applied in the attempt made to weigh the Royal George, it would most probably have succeeded.

*Observations on a new Species of hard Carbonate of Lime ; also on a new Species of Oxide of Iron. By the Count de Bournon, F.R.S. and L.S. Read May 26, 1803. [Phil. Trans. 1803, p. 325.]*

The new carbonate of lime here treated of was first noticed in a group of hexahedral pyramidal crystals in Mr. Greville's collection. The Count, observing that the exterior appearance of these crystals was very different from that which is peculiar to carbonate of lime, endeavoured in the first place, in order to determine their nature by their configuration, to reduce them, by splitting, into the rhomboidal form of this substance ; but he soon found, to his surprise, that not only he failed in producing such a fracture, but that it was with the greatest difficulty he could break them into any regular form whatever. Their hardness he found to be much greater than that of common carbonate of lime, being such as would scratch very easily the fluates of lime, and even glass. Their specific gravity was 2912. They were colourless, and in general perfectly transparent. When heated they are slightly phosphorescent. They dissolve quickly, and with great effervescence, in nitric acid.

After various attempts, he found at length that these crystals would admit of being divided into two directions, tending to produce a rhomboidal tetrahedral prism. A great part of the paper is taken up in describing the angles produced by these fractures, and also the figures of all the different crystals he had opportunities of observing ; which descriptions are illustrated by drawings.

This substance, upon further inquiry, does not appear to be very scarce, there being no less than twelve specimens in Mr. Greville's collection, most of which came from Carinthia and Transylvania, and some from Scotland. The delicate stalactitical substance, hitherto known by the name of *flos ferri*, belongs to this species of carbonate, of which the crystals, though ever so minute, have so singular a degree of hardness as to resist the common efforts of the fingers to break them.

The matrix of this kind of carbonate is generally a brown oxide of