is the best article for saturating plaster moulds; successive coats are to be laid on, until it is no longer absorbed; the moulds may be then exposed to the action of the sun, or kept in a warm place, until the oil is dry. This will give to them a dark brownish yellow colour, a smooth surface, and a texture resembling earthenware; in this state there is little danger of their chipping, or being otherwise defaced.

In order to form the plaster mould, a cylinder of wood must be turned, of the diameter of the intended roller, and several inches more in length. The composition of which the rollers are made, contracts in length very considerably, after being cast, before it becomes set, for this, allowance must of course be made in the length of the moulds.

Experiments and observations on some alloys of Platinum. By THOS. COOPER, M. D. *President of the South Carolina College.*

TO THE EDITOR OF THE FRANKLIN JOURNAL.

College: Columbia, South Carolina, Feb. 24, 1827.

DEAR SIR—I read always with great satisfaction your very useful publication, the *Franklin Journal*. It deserves encouragement, and I hope it will meet with it.

You gave us some time ago, a process from some German chemist, for making a gold-coloured alloy, by means of virgin platinum. I tried the proportions indicated with pure malleable platinum, and found the recipe worthless. No furnace or forge, urged with a fire of wood charcoal, can possibly melt the mixture prescribed. The platinum I used, was some I bought of Dr. Bollman, procured by dissolving the crude platinum in nitro-muriatic-acid; precipitating by sal ammoniac in solution; stopping so soon as the brown precipitate of palladium appears; washing the nankin coloured precipitate *moderately* in water; drying it; heating it in a flat vessel, under a muffle, to drive off the nitro-muriatic-acid; collecting the gray coloured metallic powder; compressing it in an iron box with a powerful screw; alternately hammering it (gently at first) and annealing it, till it will bear extension under the hammer. My specimens are of specific gravity 20.8. In the following experiments I used this platinum, rolled thin and cut into small pieces.

I took of copper, by weight, 16 parts: platinum, 4 parts: metallic zinc or spelter, 3 parts. I melted the copper first, and then threw in the zinc and platinum folded up in paper, adding some rosin. The heat was then kept up for half an hour, and the alloy poured into an ingot-mould, greased. I had tried three experiments with different proportions of the materials, before I settled upon this.

The result was, an alloy, well fused, clean, even surface, compact, of a very passable gold-colour, and bearing an excellent polish. Other proportions of the metals employed may answer better, but this an-

swers (as I think) very well. If too yellow, add a little more copper: if too red, a little more zinc.

I am informed that although zinc will not unite chemically with copper in a greater proportion than 25 per cent., yet the brass makers by pouring the zinc into melted copper, make a brass, containing 35 per cent. of zinc. In my mixture the zinc is about $\frac{1}{3}$ th part. If I were to suggest any alteration, it should be to increase the platinum to 5 parts instead of 4.

These experiments led me to believe that platinum would be a great improvement to *speculum metal*. I therefore made the following mixture, three several times, viz. Copper, 320 grs. Tin, 165 grs. Zinc, 20 grs. Arsenic, 10 grs. twice using the white arsenic, and once the metallic arsenic (the fly stone of the Philadelphia shops.) In all 515 grs. The results were, a bluish-white, silvery mixture, very dense and very brittle, bearing a fine polish, having a considerable increase of specific gravity: such as I remember to have procured formerly, on repeating Mr. Edwards' receipt for *speculum metal*. The above proportions are very nearly his, and Mr. Little's, as you will immediately recognize. The specific gravities were. 9.—9,116 and 9,3. I remelted them altogether, and the specific gravity of the mixture was exactly 9,1. The colour, the fracture, and general appearance, were manifestly improved by remelting.

I then took the same quantities and proportions as at first, adding to them 60 grains of platinum, making the whole weight 575 grains. It melted into a yellowish-white, very close grained alloy, bearing a far better polish than any of the specimens above mentioned. Specific gravity, 9,472. The platinum appeared to be a manifest improvement. The yellowish colour (which I did not expect) may be no disadvantage, as the yellow ray is much the most luminous. The acquisition of density in the specimens after Mr. Edwards' and Mr. Little's proportions, and the apparent defect of density in the specimen with platinum, I know not how to account for, except from the general fact that no alloy follows the arithmetical proportion of specific gravity.

Specific gravity of the copper used,	- - -	8,487
Of the platinum,	- - -	20,8
Of the tin, (grain tin,)	- - - not taken.	
Of the zinc,	- - -	7,078
Gold coloured alloy,	- - -	9,0487
Of the white coloured speculum metal,	- - -	9,1
Of the speculum metal with platinum of a yellowish-white colour,	- - -	9,472

The superior density of this last alloy, I suspect to be owing to the arsenic.

I am, Dear Sir, your friend and servant,

THOMAS COOPER, M. D.

P. S.—I hope some ingenious workman in metals will repeat these experiments.

Progress of Manufactures and the Arts in France.

Although the French have been long and justly celebrated, for the beauty, taste and excellence of many of their productions, they have remained very far behind the English in the manufacture of fabrics of cotton; in the extent and perfection of their iron works, as well as in a considerable number of other important branches of metallurgy, and other arts. Within a few years, however, they have made rapid strides towards perfection in these branches of industry; the pressure which has been so heavily felt by the manufacturers of Great Britain, has caused many thousands of them to remove to France, where they have taken the machinery and the knowledge, in which that country was deficient. The evident policy of the French nation, was liberally to encourage persons of this description, and they have not neglected their interest in this particular.

In a late number of the "*Annales de l'Industrie*," there is a notice of an extensive iron work established at Charenton, in the vicinity of Paris, by Messrs. Manby and Wilson. The writer of this notice observes, that these works exhibit the perfection which the art of working in iron has attained in England, and which is now naturalized at Charenton, where may be evidently seen, the immense superiority of large works, to those on a more limited scale, which are always indifferently provided with the means of working, and the productions of which are consequently restrained, both in their forms and dimensions, by the extent of the works; that under consideration, will supply whatever is required, without resorting to foreign countries; and with the rapidity, perfection and economy of the English manufactories.

At the establishment of Manby and Wilson, there are about 700 workmen employed, about 350 of whom are from England, and an equal number are natives of France.

Steam Engines of all dimensions, as well as all kinds of machinery required for carrying other manufactures to perfection, may be obtained at these works.

The notice contains many details of the mode of procedure, in casting, forging, turning, &c. in the large way, which although new in France, are extensively known in this country.

The following observations on the perfection of some other arts in France, are from a late English paper.

"Within these twelve years, France has made immense progress in almost every branch of manufacture. Pins are now made at a single operation, the 'heads and tails' being of a piece; so that the proverb, 'As useless as a pin without a head,' is likely to be soon lost, from the thing not being possible.

"A new discovery has been made in printing, by which classical works used in every country, need only to be set up once: thus, if an edition of the classics be printed at Paris, editions may be published in England, Germany, Holland, &c. without being at the expense of a new composition. Besides the advantages of cheapness, the text, once established, can never vary, and the type is *always*

new. We have seen three volumes in 8vo. printed upon the new principle; they are beautifully got up, and sold to the public at less than 3s. the volume."

"In the article of plated goods, the French seem even to surpass the manufacture of Birmingham. We have seen plated candlesticks, of which the making cost only five sous the pair, and they are sold at twenty pence in retail. The same manufacturer has discovered the method of making coffee-pots, tea-pots, &c. of one piece of metal, without soldering, and that too at a cheaper rate than by the old method: we have seen several articles of this kind, of very elegant forms."

"The gilding of metals is now carried to a perfection unknown in England; and as the duty on importation amounts to a prohibition, one of the best French gilders is going to establish himself in London. Our dessert services may thus rival the French in elegance and cheapness; and it is to be hoped that we shall soon be delivered from the heavy tribute paid to France for all objects in *or molu*: it is a branch of industry which would be most lucrative, and which it would cost a mere trifle to create: whoever does it, is certain to realise an immense fortune."

An easy, method of dividing plates of hardened steel, such as saw plates; and also of perforating them, when requisite.

BY THE EDITOR.

Workmen frequently wish to divide a broken saw plate, for the purpose of converting it into scrapers, square-blades, or small saws; this is usually attempted by notching them to a small depth with a cold chisel, and then breaking them along the lines so made. When the plate is very hard, this method will not succeed, and the plate is frequently destroyed in the attempt. When it does succeed, the plate is generally twisted, and *buckled*, in the operation.

The Editor had a hard plate, which he was desirous of cutting into strips, to make small saws for a working model of a saw mill; this, although too hard to yield to the chisel, he divided with the utmost facility, piercing the ends at the same time, for the purpose of stretching the saws; this was effected in the following manner. The saw plate was made sufficiently warm to melt bees-wax, which was then rubbed over it, so as to coat it completely on both sides, when it was suffered to cool. Lines were then drawn through the wax on both sides of the plate, with a steel point. It being of great importance that these lines should be exactly opposite to each other, this was effected by making a saw-kerf in the strip of wood which was used as a straight-edge, and the plate being placed in the kerf, the opposite lines were easily drawn. A mixture of sulphuric acid (*oil of vitriol*) and water had been prepared, and suffered to become cold;