

it that substance, whiteness, delicacy, &c. which Pliny so clearly indicates.

An indisputable proof of this fact exists in the papyri, lately described by Champollion, which cannot possibly have been formed by mere contexture, but must have been the result of maceration, and a fusion of the parts into one another. The same remark applies to the sort called *Saitical*, which Pliny states to have been made from rags and the vilest refuse. The process appears to have been known in times posterior to those of the Roman naturalist; for Cassiodorus, who lived at the emperor Theodoric's court at Ravenna, when recommending paper making to the assiduous attention of his contemporaries, makes special mention of maceration, but never of contexture. It should also be recollected, that, in Cassiodorus's time, five centuries later than Pliny's, Ravenna was celebrated for the manufacture of paper, which was composed of the *scirpus raven-natus*—in all probability, nothing more nor less than the common rush of our own rivers. Ginnani is of opinion, that this was the paper which constitutes the greater part, if not the whole, of the papyri now extant in the principal libraries of Europe: a circumstance which serves to strengthen the opinion many have entertained, that the papyri of Herculaneum were made of a pap, derived from the refuse of old leather, and capable, as results from repeated experiment, of resisting the effects of fire and water. [*Athenæum*.]

On the dark precipitate of Platina of Ed. Davy, and on the property of spongy Platina. By M. LIEBIG.

THE black precipitate of Davy is obtained by heating the sulphate of the oxide of platina with alcohol. This substance, when dried, emits an ethereal odour, and possesses the remarkable property of becoming red hot when moistened with spirit of wine, and continuing so as long as the alcohol remains. Acetic acid is formed during the ignition.

M. Doebereiner ascertained that this substance absorbs all the combustible gases, but does not absorb either oxygen or carbonic acid. Saturated with hydrogen and placed in contact with oxygen, it effects their combination, and becomes incandescent. Presuming that finely divided platina might possess the same property, he tried it, and thus discovered the remarkable inflammation of hydrogen by spongy platina.

The best mode (according to the author) of obtaining the black precipitate, is to procure the *chloruret* (chlorure) of platina, by heating strongly, and for a long time, the *chloride* of the same metal, and to treat this chloruret, which has a greenish yellow colour, with a concentrated solution of potash. It forms with heat a perfect solution, dark and thick, into which alcohol is to be poured by slow degrees, shaking it well. In a short time it effervesces strongly, discharges much carbonic acid, and a very heavy velvet black powder subsides, which must be boiled successively with a little alcohol, hy-

drochloric acid and potash, and lastly four or five times with water, and then washed and dried in a porcelain capsule, without coming in contact with a filter or any organic substance.

This dark powder is granular and hard, and loses no weight by being strongly calcined in the air. It dissolves in aqua regia, and gives a limpid solution, which contains only chloride of platina. Moistened with spirits of wine, it quickly ignites, and produces acetic acid; placed in a receiver filled with oxygen, over mercury, and moistened with alcohol, the mercury soon rises, acetic acid is formed without the least trace of carbonic, and in a week or a fortnight the oxygen is completely absorbed.

In the air, it instantly inflames hydrogen. Its specific gravity is about 16. It is therefore nothing more or less than metallic platina extremely divided, acting like spongy platina, only in a more intense degree.

Metallic platina precipitated by zinc, from its acid solution possesses the same properties.

The platina black (to avoid periphrasis) possesses in the highest degree the property of absorbing and retaining a multitude of gases.

If it is not boiled well in water, or if, before drying it, it is moistened with spirits of wine, the latter cannot be expelled entirely even under the air pump. If, in this condition, it is heated to the temperature of boiling water, it begins to ignite, and burns the paper on which it is placed. Even though entirely deprived of alcohol, and after being dried in an exhausted receiver aided by the presence of sulphuric acid, if brought suddenly into contact with air, it becomes occasionally so heated by the absorption as to ignite and burn the paper.

The solution of chloruret of platina in potash, being mingled with a notable quantity of nitrate of copper, forms by boiling in spirits of wine, a precipitate, which, though it contains at least twice as much oxide of copper as platina, retains the property of igniting with alcohol.

According to Mr. Doebereiner, one hundred grains of platina black absorb twenty cubic inches of hydrogen gas. This reduced to comparative volumes gives one to seven hundred and forty-five, which sufficiently accounts for the great elevation of temperature and ignition with hydrogen or alcohol.

Even iron possesses an analogous property. If obtained by the reduction of its oxides by means of hydrogen, it is in such a state of extreme division as to combine with oxygen, so rapidly as to inflame at the common temperature.

Both the black and the spongy platina lose the property of inflaming by continued use, owing to their becoming more dense or less porous, or from having their pores obstructed by foreign matter; or from the air which they contain losing its oxygen. The method of restoring the property is to boil it in nitric acid, which has no other object than to expel and replace this air. Boiling the sponge in water answers the same purpose.

The absorbing power of finely divided platina appears to be analo-

gous to that of some other substances, except that it acts so much more powerfully on inflammable gases. Charcoal absorbs very little hydrogen, not so much even as dry wood. The effect in each case doubtless depends in a great measure on the relative dimensions or figure of the molecules of the gas and of the imbibing substance. Hydrogen contained over mercury in a receiver, which has a crack in its upper part, will gradually escape and the mercury will rise, in opposition to its gravity. No other gas possesses this property.

It would appear reasonable to ascribe the ignition of the spongy platina in part to the extermination of latent heat, arising from the affinity of oxygen and hydrogen, or in other words, to electrical action. But charcoal absorbs both ammoniacal and muriatic acid gases in equal proportions, when the electrical states are directly opposite. Affinity therefore cannot be the cause of the absorption, nor is it more probable that it is so in the case of platina and hydrogen.*

[*Annales de Chimie.*

FRANKLIN INSTITUTE.

Report of the Committee of Premiums and Exhibitions.

To the Board of Managers of the Franklin Institute, for the Promotion of the Mechanic Arts, the Committee of Premiums and Exhibitions respectfully report:

THAT in pursuance of the arrangements previously made, their 6th exhibition of domestic manufactures was held at the Masonic Hall, on the 14th of September, and continued open for five successive days, during which it was most extensively visited, both by the members of the Institute and by the public at large. It is conjectured that not less than 20,000 persons visited the exhibition, all of whom experienced, we believe, the highest satisfaction at the great improvement it manifested. It was not so much by the number or quantity of the articles deposited, as by their great excellence, and by the visible amelioration in their quality that this exhibition distinguished itself from all preceding ones. We do not propose to notice here (indeed it would be impossible to do so satisfactorily) all the various objects presented; as many were brought in after the exhibition had commenced, and could not be regularly recorded in the catalogue. We will first report on those articles that claimed a premium.

Of the 37 premiums proposed by the Institute, three only are adjudged to be due.

The first is "for the best stock or standing vice, equal to those called Tower Vices, and weighing thirty pounds or upwards, not less than three to be exhibited," which the committee consider to be

* Has the experiment been tried of causing dry powdered fresh charcoal to absorb a portion of ammoniacal gas, and then to place it over mercury in a receiver filled with muriatic acid gas? would ignition ensue?