The Editor of the *Recueil Industriel* has described several cases, in which the presence of silicon appears to have an important influence of this kind. Some time since, Dr. Eynard of Lyons, having put some files into a mixture of five parts of water with one of sulphuric acid, was astonished when he took them out, to find, at the bottom of the glass vessel in which they had been placed, a grayish white and glairy substance. This, being collected and dried, proved to be silica.

In 1732, MM. Perru of Neufchatel established a manufactory of steel cylinders at Lyons. These cylinders, which were highly polished, and so hard as to be untouched by the file, had been fused, it is said, with *silica*. They have never been imitated. A pair of these cylinders, 5 inches in diameter, sell at this time for 2400 francs.

Some years since, a person of the name of Ranquet, of Lyons, formed vessels of white cast iron of extreme hardness. M. Culhot manufactured cylinders from the fragments of these vessels, and the cylinders were of such hardness, it was impossible to shape them by cutting instruments, so that they could be worked only by emery, and similar substances, occupying months for the purpose. This person made a secret of his process, but it is said, used no charcoal in his process.

M. Eynard found silica in cast iron, but not in forged iron; its occurrence in the former, or rather the presence of silicon, is a well known circumstance.

Upon these facts, the Editor founds some earnest recommendations to those who have the opportunity of ascertaining whether the cementation of iron without charcoal, but with silica alone, would produce steel, and in what proportions the silica ought to be mixed, to obtain a very perfect and hard steel; there are also other points urged, which are either already upon the minds of metallurgists, or are naturally suggested by the two above.

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Copal Varnish. By J. J. BERZELIUS.

COPAL reduced to coarse powder, and watered with caustic liquid ammonia, swells, and is converted into a gelatinous mass, which is entirely soluble in alcohol. To effect this solution, which makes a very beautiful varnish, liquid ammonia is to be added, by degrees, to pulverized copal, till the swelling ceases, and it becomes a clear and consistent mass. It is then heated to 35° cent., and introduced in small portions at a time, to alcohol of 8, having a temperature of about 5° cent., shaking it well after each addition. A solution is thus obtained, which, after depositing an insignificant portion of sediment, is absolutely colourless, and as clear as water.

[*Journ. de Con. Usuelles, Oct. 1828.*