but in the newer they are less roughly manufactured, and sometimes perfectly smooth and polished. In the upper beds of all there are remains of the Romans; while in the bottom deposit the human weapons are mixed with the remains of extinct animals totally different from those which now inhabit the country. Between the two are beds of sand, brick-clay, and earth, containing remains of animals much nearer the present time. Above that are the deposits containing remains of the Romans, and above that, vegetable soil.

(*To be continued.*)

NEW INDUSTRIAL PROCESSES.

Patera's Process for Extracting Silver from its ores.

By Clement Le Neve Foster.

The process in question was originally suggested by Dr. Percy, F.R.S., of the Government School of Mines, and has of late years been taken up and carried on, on a large scale, by one of the most celebrated metallurgical chemists in Austria, viz., Herr von Patera. This process is of special interest, on account of the analogy it presents with the well-known "fixing" in photography, which is nothing more than dissolving out the chloride of silver (which has not been acted on by light) by means of hyposulphite of soda.

In the metallurgical process this property is made use of in the following manner:—The ores which contain the silver in combination with sulphur, or with sulphur and arsenic, are roasted with green vitrol and common salt, and thus is produced a chloride of silver which may be dissolved out by a solution of hyposulphite. The silver can then be precipitated by sulphide of sodium, falling down as sulphide of silver. All that is necessary to be done then is to heat the sulphide in a muffle in contact with the atmosphere; the sulphur escapes in the form of sulphurous acid, and the silver remains in the metallic state. It is then melted in plumbago pots and cast into ingots for the mint. Such is a rough outline of the process which is now, and has been for some years, in operation at Joachimsthal, on the the northern frontier of Bohemia. The ores which are subject to this process are rich in silver, containing on an average two per cent., but often as much as 10 per cent. Ores containing less than one per cent. are melted down with pyrites in a cupola blast furnace for regulus or *matte*, which is then treated as the ore.

The advantage of this process are manifold, 1stly, Ores containing large amounts of arsenic can be thus successfully treated, when Ziervogel's process would fail. 2ndly. the expense of heating a strong solution of salt, as in Augustin's process, is got rid of, as the hypo-sulphite is used cold. 3rdly. The hypo-sulphite filters quicker and better than the brine in Augustin's process, for the dissolving power of hyposulphite being great, a weak solution may be used. 4thly. The solution of hyposulphite may be used over and over again, for it is being continually renewed, as this is one of the peculiar points in the process, it deserves particular attention. The precipitation of the silver is effected, as has been before stated, by sulphide of sodium, and this is a polysulphide, for it is prepared by calcining soda with sulphur and then boiling it with sulphur. In this manner a polysulphide of sodium is formed, but in contact with the air some hyposulphite of soda is generated, and thus, each time that the silver is precipitated, some hyposulphite of soda is added to the solution. In this way Herr von Patera, who commenced with 14lbs. of hyposulphite of soda (and who yearly extracts more than 3,000lbs of silver), has never needed a fresh supply, and has, in fact, been obliged to throw away quantities of solution, as his stock was always increasing. The expense of this process is not great; the extraction of a pound of silver from the ore costs, on an average, only 9s. 9d., whilst by the method of smelting formerly in use, the cost of production of a similar quantity of metal was no less than 16s. —*Journal of the Society of Arts.*

Preparation and Uses of Neutral Sulphite of Lime.

Anthon, a manufacturing chemist, of Prague (*Oesterr. Gewerbeblatt.* 1860. No. 1), makes sulphite of lime by passing gaseous sulphurous acid over hydrate of lime spread upon hurdles to the depth of one or two inches, and arranged in a close chamber; or he places the hydrate of lime in a barrel, which is made to revolve, and passes the sulphurous acid into it. The absorption of acid by the lime takes place quicker when the latter plan is adopted. It is only necessary to wash the sulphourus acid when it is contaminated by sulphuric or some other strong acid. When the lime is kept well in motion, the saturation is completed in from four to eight hours, and is recoguised by the white colour of the hydrate changing to a pale yellow.

The principal use of sulphite of lime, which the author points out, is the ready preparation of a pure sulphurous acid.

New Fusible Alloy.

Mr. Wood has found that cadmium is preferable in many respects to bismuth in rendering a mixture of metals easily fusible. He prepares an alloy fusing at +76° centigrade by melting together 1 or 2 parts of cadmium with 2 parts of tin, 4 parts of lead, and 7 or 8 of bismuth.

Clarifying Coal Oils.

Messrs. Dumoulin and Coutelle have been making a series of experiments with a view of rendering heavy oils suitable for ordinary lighting purposes, and have succeeded in producing a magnificent light, free from smoke and smell, and adapted in all respects for burning in a room. The following is their process:—In a close vessel are placed 100 lbs. of crude coal oil, 25 quarts of water, 1lb. of chloride of lime, 1lb. soda, and ½ a pound of oxide of manganese. The mixture is violently agitated, and allowed to rest for 24 hours, when the clear oil is decanted and distilled. The 1000lbs. of coal oil are to mixed wilh 25lbs. of resin oil; this is one of the principal points in the manipulation, it removes the gummy parts from the oil and renders them inodorous. The distillation spoken of may terminate the process, or the oils may be distilled before they are defacated and precipitated.—*Le Genie Industriel.*

A New Use for Paraffine.

Every chemist has experienced the annoyance of finding the stopper of his liquor potassæ bottle hard set. Greasing the stopper would only afford a partial remedy, and moreover, would be objectionable chemically, inasmuch as the liquor potassæ would suffer contamination. Paraffine is unobjectionable; not only does it not dissolve in alkaline leys, but its lubricating properties are sufficient to prevent all jamming of the stopper.

Perchloride of Iron as a Deodorizer.

From the experiments of Dr. Hoffman and Professor Frankland, it appears that perchloride of iron far surpasses both "chloride of lime" and lime, for deodorizing sewage water.