but insipid to the taste. In this later character the solution resembles many colloid bodies which seem not to have sufficient diffusive power to pass through the membrane covering the tongue in order to reach the nerves of taste. After having been made some days, the solution of silica assumes the consistence of glycerine, and afterwards gelatinizes, silica eventually separating in a solid insoluble form. The solution has a peculiar action upon gelatinous substances, such as skins, being absorbed by them, and converting them into a kind of leather, so that it is possible that flint may eventually become a cheap substitute for oak-bark in the process of tanning. On the addition of any carbonate, as chalk or limestone, the silica is caused to solidify in its substance in a hard flint-like form, and offers the possibility of converting soft and perishable limestone, by artificial means, into a hard and enduring siliceous stone.

Again, peroxide of iron may be dissolved in hydrochloric acid, thus constituting the perchloride of iron. This has the power of dissolving a large excess of the peroxide of iron. If this solution of the peroxide in the perchloride of iron be dialised, the chloride passes through, leaving the pure oxide dissolved in water in a colloid state. This also can be rendered gelatinous in the same manner as silica.

Prussian blue, insoluble in water, is perfectly soluble with oxalic acid, and if this solution be dialised, the oxalic acid passes away, and a solution of pure Prussian blue remains. This may be gelatinised by the addition of a little dilute sulphuric acid and by many other re-agents.

After having enumerated these examples, it is scarcely required to indicate the probable practical value of the process. It will certainly be employed to prepare solutions of many colloid dyeing materials, which will afterwards be caused to precipitate on the cloth, and so be capable of being used cheaply, and without a mordant. As a means of separating many mixtures, its use is obvious. It is probable that many valuable crystalized ingredients that now require for their preparation expensive and troublesome operations, may be separated from the crude mass of vegetable tissues with which they are associated naturally, by the inexpensive process of dialysis.

In fact, in all those arts which act by purifying, by refining, by separating different ingredients, and in those which like dyeing, require the employment, in a soluble state, of substances which are usually insoluble, we cannot discern a limit to the practical application of this new operation.

ARTESIAN WELLS.*

By G. R. Burnell, C. E., F. G. S.

The next important artesian borings executed of late years in chronological order, were those undertaken under the superintendance of the French military authorities in the Desert of Sahara, avowedly for the purpose of forming stations for the caravans trading between Algeria and Central Africa. They were executed by means of tools made by Messrs. Degoussee and Laurent, who seem also to have occasionally acted as consulting engineers, but the works were actually performed by the soldiers, or the labourers employed by the "Corps du Genie Militaire" It appears that up to the month of June, 1860, no less than 50 of these wells had been sunk in the desert, and that they pour upon its thirsty surface no less than 7,920,000 gallons of water per day. Similar works were, according to Aime Bey, executed in the deserts of Ancient Egypt, as was before alluded to, and there are good reasons for believing that the system of artesian borings might advantageously be applied in the deserts of north-western India, and of Australia.

Some interesting artesian wells and borings have also been executed in various parts of England and of the continent, to a few of which I propose to return hereafter, but in the meantime, I pass to the description of the great work lately completed at Passy, as being the one which has attracted the most universal attention. When the great works of the Bois de Boulogne were commenced, it was soon discovered that pumps of Chaillot would not be able to furnish the quantity of water required for the lakes and waterfalls of the new park, and the Municipal Council of Paris, encouraged no doubt by the commercial results of the previous operation at Grenelle (which had eventually cost the sum of £14,000, and had repaid its cost several times over), resolved to execute a second boring to the lower green sand, in order to secure an independent supply. It was originally proposed to execute this well of the same dimensions as that at Grenelle, that is to say, to finish with an eight-inch bore; but before it was commenced, M. Kind, a German engineer, (who had already carried out some very important works upon a system, and by the aid of tools patented by himself,) offered to contract for the new well to finish with a bore of 2 ft. in diameter, and to deliver the water at 92 ft. above the level of the ground, at the rate of nearly 3 million gallons per day. He undertook to complete the work for the sum of £14,000 within the space of two years. After some opposition, based principally on the doubts expressed by engineers, who had been consulted on the subject, with respect to the increased delivery over that of the well of Grenelle, this offer of M. Kind's was accepted, and on the 23rd December, 1854, the vote of the Municipal Council in favour of the contract with him was passed. The work was commenced shortly afterwards, and by the 31st of May, 1857, the boring had already reached the depth of 1,732 feet from the surface, when suddenly the upper portion of the tube lining collapsed, at a distance of about 100 feet from the surface, and choked up the bore-hole. This accident delayed the completion of the work for three years, and led to the rescinding of the contract with M. Kind; but the engineers of the city of Paris were so satisfied with his zeal and ability, that they confided to him the conduct of the remaining works. A new well was sunk to a depth of 175 feet 4 inches, and the boring was then cleaned out and resumed. Much trouble was encountered in traversing the strata below the distance of 1,732 feet above quoted, and at length, at the distance of about 1,894 feet from the surface, the first water bearing stratum was met with, but the water, after several oscillations did not rise to the level of the ground. The boring was continued below this level, until, on the 24th September, 1861,

*Abbreviated from the Journal of the Society of Arts.