

all scales that have formed in the boilers, and will completely resist the formation of any new scale, by holding the mineral salts in the feed water in a sludgy sediment until it can be blown out through the mud drum or otherwise. With this preparation the difficulty of using the hard water of wells or from other sources is entirely overcome, and the increased safety in the use of boilers and great economy in the consumption of fuel is assured, thus saving the additional cost of repairs and extra time and labor in cleaning out, and also saving valuable time of employes frequently lost by delay. This solvent is a dry powder which will not deteriorate by exposure to the weather. It is mixed thoroughly in a bucket of warm water and administered at the man-hole, safety valve, through the feed water pump, or any other convenient manner, and costs only from two to five cents per day for each boiler.

#### ABOUT EMERY.

Emery is a sub-variety of corundum, which is found in rhomboidal crystals, and is colorless or colored, being met with in all degrees of transparency. Its degree of hardness is 9. corundum is found as a precious stone (ruby or sapphire), as ordinary corundum of brownish color, and as emery in close masses mixed with magnetic iron. On account of these admixtures emery possesses a hardness which is barely half that of sapphire. Its specific gravity is 4.31, and in contrast to other stones of equal hardness it has the peculiarity that when crushed or triturated its smallest particles preserve their capacity of polishing, as they remain sharp-pointed. This property exists in the same degree in no other substance of equal hardness, and is wanting in artificial emery, which, possessing similar hardness, color and weight, is often used for the adulteration of the genuine article.

The best emery is found in the island of Naxos, in clay deposits and also in marble. It is in pieces varying in size from walnut to blocks of several hundred weight. It is often found in veins three feet in thickness, and less frequently in globular shape or large pieces, which are probably the results of volcanic eruptions. At one time Naxos was the only known source of emery, but since then the Levantine or Turkish emery was discovered, which, although of inferior quality to the Naxos article, is yielded in about ten times the quantity. The places where it is found are numerous, but only those near the coast are of practical importance, on account of the difficulties attending transport in that region. The principal locality where emery is found is near the towns of Magnesia, south-west of Smyrna and Aidin, in Western Asia Minor, in the plains of Macander. Deposits of emery also exist in limited quantities in the islands of Samos, Chios and Cyprus.

The manner in which the emery is obtained is primitive, and is about the same in most places. When embedded in clay it is simply dug out; if in marble, the latter is removed by the force of the swelling of pieces of wood, which are placed in position and wetted. When removing emery from the veins alluded to, it is brought to the surface by primitive lifting appliances. Such a shaft is seldom deeper than 65 feet. The smaller pieces are ready for transport. This is effected by heating them in a fire of bushes, and throwing water upon them, by which means they are divided into blocks of about two cwt. The emery is carried by donkeys as far as Syria, from which place it reaches the various commercial centres, such as London, Marseilles, Amsterdam, etc. The leasing of the emery quarries is effected by the Greek and Turkish governments in lots of 2,000 to 3,000 tons, under very stringent conditions.—*Etc.*

#### THE DISCOVERY OF ENAMEL.

At South Kensington a two-light window in silver stain sets forth the life and labors of Palissy, the potter, says the Magazine of Art. The first light depicts that well known episode of Palissy breaking his tables for fuel. The domestic tragedy is quite prettily conceived. In the centre of the composition stands Palissy, tall and alight, dressed as a gentleman should be, in doublet and hose. His left hand is grasped by a gentle young woman wearing a dress and coif of the fourteenth century, and only faintly recalling the virago whose incessant nagging the potter held to be the worst of all his persecutions. In his right hand the museum Palissy holds an axe; at his feet are fragments of most substantial furniture, which he contemplates with genteel bewilderment, as though surprised at his great prowess in effecting such a breakage.

Six years before the day on which the little tragedy took place, young Palissy the glass painter had been a newly married man, settled in the town of Saintes, in the fertile province of Saintonge, and near by the famous salt marshes of Marennes. By birth he belonged to the diocese of Agen, where he had learned the noble trade of glass painting. The young artist was a man of rare qualities of mind; he had little book learning, but a great craving for knowledge, though the wisdom he wished for was not to be gained from books in the days of King Francis I.

For the knowledge that Palissy yearned to possess was a knowledge of nature and her ways of the growth of the earth, the formation of the springs, the action and ever changing limits of the sea. So when he grew to manhood, to gain this learning Palissy left Agen and travelled throughout the length and breadth of France, thinking and wondering much of nature and her marvellous ways, and earning his bread by glass painting and by portraiture, in which art he had some skill. At length, after about ten years of wandering, he settled in Saintes, most likely because it was the home of a certain young woman who, perchance, was not a virago until hunger and disappointment, poverty and the loss of many children, had soured her temper. So, in 1540, we find Palissy settled in Saintes, a man who from his writings we may judge to have been looked up to by his fellows; an intelligent artist, a local leader of the reformed religion and a collector of all manner of fossils and curious stones. Anything strange delighted Palissy, and we read in his writings how such an one brought him an ammonite and another gave him an old stone that he had dug out of his garden, and of things that people brought to his workshop for him to look at and explain to them if he could. So when in the year 1540 "an earthen cup enamelled with much beauty" found its way to Saintes, it was naturally taken to the house of Bernard Palissy.

The days of Francis I. seem so civilized and like to our own that it is hard to realize the gulf which in many ways divided them from our times, and it is with ever recurring surprise that we remember that in those days no glazed or enamelled ware of any kind was made in France; that porcelain—not to be made in Europe until nearly two centuries later—had hardly begun to be exported by the Portuguese from their new settlement at Macao; and that any art pottery that was in France was Italian majolica, which was imported in only small quantities and at a very high price. How rare it was we may judge from the fact that Palissy, who in the way of trade had entered many noble houses, had never in all his travels seen such ware till in the year 1540 this enamel cup was shown him. But as he held it in his hand it occurred to him how glass painting was yearly less in vogue, how overstocked the trade, how poor the pay; and that if once he should "discover how to make enamels, he could make earthen vessels and other things very prettily, because God had gifted him with some knowledge of drawing." So from that day Palissy resolved to discover how the enamel was made. In that masterpiece of naive writing, "*L'Ariste en Terre*," he tells us most simply and powerfully the hardness of his search; that he was as one who gropes in the dark, having no knowledge of clays or of pottery, no conception of the substances of which the enamels were composed and guided only in his search by his knowledge of glass and his long study of nature. This much only he was told; The white enamel was the thing to seek for, since it was the basis of all the others. Palissy set to work to build himself a potter's furnace. Then, taking all the substances he could suppose likely to make anything, he pounded and ground them and making a great quantity of different mixtures and proportions, bought some pots, broke them, and placed some of the powder on each of the potsherds. He then marked each of the fragments, and having written down what compound he had placed on each baked them in his oven.

In this way he worked on for several years, never getting any result; this less because his materials were wrong than because his furnace was not hot enough, and because he was so ignorant of the right manner of arranging the crocks that "if the material had been the best in the world, and the fire also the fittest, it was impossible for any good result to follow." Every compound he had tried again and again; he had used a furnace of his own till his means were exhausted, and too poor to buy fuel, he had begged permission of the pottery a league and a half distant, where he brought his pots, to fire his experiments there, "always with great cost, loss of time, sorrow and confusion."

At last he saw there must be something fundamentally