

gay streets and gardens and brilliant saloons, begged to be permitted to retire, for a time, into a darkened room, in order to enjoy in their peculiar way, a good feed of train oil and tallow. The scientific gardener does not belong to this low order of mankind; but still he is not disturbed by disagreeable emotions, as many other persons are, by the sight of decaying organic matter.

An eminent writer on the Philosophy of Pleasure says:—

"Some of the most delicious perfumes and flavours, as those of the Pine Apple, can be made from the most noisome substances, with the slightest chemical changes. A few years ago there were sweetmeats held in great regard by the palates of the young. They were called Fruit Drops. Among them was a ball of sugar, shaped like a pear, and it had the perfect flavor of the old French Jargonelle. Suddenly these fruit drops went out of repute; nobody would buy them: hardly would one venture to speak of them; the confectioners, who had invested in these wonderful sweetmeats, found that their stock was useless. In a single night they had been blighted. A chemist had been heard to say, in a popular lecture, that he could go into any stable and take from its drains a product which, by the veriest fraction, he could convert into these delicious fruit juices. Intelligence of this fact speedily spread far and wide, and all the little boys in the land resolved that, henceforth, for them there should be no more pear drops."

Now the delicious juices of fruits, the brilliant colors of flowers and the delightful aroma of grapes, all find their elements in the compost heap. Resulting from decay, they are purified by chemical change, and often are converted into brilliant crystals before they enter the substance of plants, which possess a wonderful power of selecting what is suited to their nature, and rejecting what is injurious and offensive. So that the plant, or flower, or fruit, which is produced by these agencies, is as pure as sunlight itself.

But the compost heap need not be an offensive object. Put into it all the waste substances, such as I have enumerated, that you can find—recollecting that the heap does not absolutely create, and, therefore, cannot make much out of little,—and do not forget constantly to add fresh lime, or lime and salt,—and upon each layer of six inches or one foot of waste material, place two or three inches of old sod or good clay loam, and you will have no offensive odors arising from the chemical changes. Good strong loam or, better still, pure brick clay, will be found the most powerful and valuable deodorizers that can be employed; and even the most fastidious in such matters will then cease to complain of your compost heap.

London has a society for the saving of life from fire, by means of which 89 persons were rescued during the last year, from 610 fires. The force is 100 strong, with 85 escape stations.

The curious fact has been observed by means of the microscope that perforations made by the electric spark are uniformly pentagonal in form

Why do honest ducks dip their heads under water? To liquidate their little bills.

Machinery and Manufactures.

How Cast Iron is made.

Under the head of "Familiar Science," the *Scientific American* says:—Many of our readers probably suppose that what we commonly call iron is an elementary natural substance, and would be surprised to learn that like steel it is an artificial article of a complex character, answering to nothing found in nature. At the same time it is remarkable how imperfectly both the character and the formation of an artificial product may be understood by those who make it. It is not many years since real iron was first refined from the chemical compound of that name, and found to be a white soft metal, looking like silver and easily pared with a knife. Even now, no one can tell us precisely what is done in the interior of those great, glowing piles where "ironstone" is melted up with limestone and comes out in the hard, brittle, granular, gray substance known as cast iron. It is a process that has come down to us from antiquity, where it was developed by experiment with little aid from science. Important as the improved and extended iron industry is to modern life, it is impossible for us to conceive of the hungry need that pricked on the primitive men in their search for the precious material of tools and above all of weapons. Nothing else could account for the success with which they felt their way to processes and results in manufacture, of the chemical nature of which they had not the slightest conception, and which we but imperfectly understand. Mr. Wm. Crossley, manager of the Ormesby Iron Works, England, in a series of papers lately published in the *Chemical News*, confesses this singular ignorance, and gives his theory of the process, and what it ought to be, from which we have already quoted as interesting to our more expert as well as youthful readers.

A blast furnace, we should first explain, is not a mere melting furnace, but a chemical retort for separating oxygen from the oxide of iron, by means of the superior affinity of the former for carbon. It is substantially an upright tube, varying from fifty to a hundred feet in height; not to afford a chimney draft, for that is superseded by a mechanical blast, but to afford room for the chemical process demanded. By this process the iron is set free from the oxygen to which it had been subjected in the state of nature; but it exchanges that master for another—carbon—making it a carbide of iron, impure with other foreign matters, such as sulphur and phosphorus, which it derives from nature or the fuel or minerals in which it is smelted.

The smelting retort, as we will continue to call it, is made of various diameters, according to the height, and the weight of ore intended to be reduced at a charge. Some lately built are as much as 102 feet in height and 29 feet inside diameter. First, a hot fire of coke or charcoal is made on the hearth at the bottom, fed from the top and gently urged by a pressure of air through two tweers or inlet tubes, 2 to 4 inches in diameter, placed near the bottom and connected with blowing engines which will be made to drive a blast of great power