Arts, Manufactures and Machinery.

Copying by Casting.

The Art of Casting, by pouring substances in a fluid state into a mould which retains them until they become solid, is essentially an Art of Copying. It also happens that the thing produced resembles entirely, as to shape, the pattern from which it was formed.

In casting iron and other metals patterns made from drawings are the originals from which the moulds for Casting are made, so that, in fact, the Casting itself is the Copy of the mould, and the mould is the Copy of the wooden pattern. In castings of iron and for the coarser purposes, and, if they are afterwards to be worked, even for the finer machines, the exact resemblance amongst the things produced which takes place in many of the Arts to which we have alluded, does not happen, nor is this necessary. As the metals shrink in cooling, the pattern is made larger than the intended copy; and in extricating it from the sand in which it is moulded, some little difference will occur in the size ot the cavity which it leaves.

In smaller work, where accuracy is more requisite, and where few or no after-operations are to be performed, a mould of metal is employed which has been formed with considerable care. Thus, in casting bullets, which ought to be perfectly spherical and smooth, an iron instrument is used in which a cavity has been cut and ground with considerable care; and in order to obviate the evil which would otherwise result from the contraction in cooling, a jet is left which may supply the deficiency arising from that cause, and which is afterwards cut off. The leaden toys for children are cast in brass moulds which open, and which have been graved into the figures designed.

Casting with plaster is a mode of Copying applied to a variety of purposes;—to produce accurate representations of the human form, —of statues,—or of rare fossils,—to which latter purpose it has lately been applied with great advantage.

In all casting, the first process is to make the mould, and plaster is the substance which is almost always employed in the cases now under consideration. The property which it possesses of remaining for a short time in a state of fluidity, renders it admirably adapted to this purpose, and adhesion is effectually prevented by oiling the surface on which it is poured. The mould formed round the original, removed in separate pieces and then reunited, is that in which the Copy is cast.

Casting in wax is a mode of Copying, which if aided by proper colouring, offers the most successful imitations of many objects of Natural History, and gives an air of reality to them which might deceive even the most instructed. Numerous figures of remarkable persons, having the face and hands formed in wax, have been exhibited at various times, and the resemblances have in some instances been most striking. But whoever would see the Art of Copying in wax carried to the highest perfection, should examine the beautiful collection of fruit at the House of the Horticultural Society, London; the model of the magnificent flower of the plant which forms the new genus Rafflesia; or the waxen models of the interials of the human body which adorn the Anatomical Gallery of the Jardin des Plantes, and the Museum at Florence.

The Art of imitation by wax does not usually afford the multitude of Copies which flow from many similar operations. This number is checked by the subsequent stages of the process, which, ceasing to have the character of Copying by a tool or pattern, consequently become more expensive Form alone is given by Casting; the colouring must be the work of the pencil, guided by the artist in each individual production.

Ancient Miners of America.

Mr Knapp, of the Vulcan Mining Company of Lake Superior has lately made some very singular discoveries in working one of the veins, which he lately found He worked into an old cave which had been excavated centuries ago. This led them to look for other works of the same sort, and they have found a number of sinks in the earth which they have traced a long distance. By digging into those sinks they find them to have been made by the hand of man. It appears that the ancient miners went on a different principle from what they do at the present time. The greatest depth yet found in these holes is thirty feet—after getting down to a certain depth, they drifted along the vein, making an open cut. These cuts have been filled nearly to a level by the accumulation of soil, and we find trees of the largest growth standing in this gutter; and also find that trees of a very large growth have grown up and died, and decayed many years since: in the same places there are now standing trees ot over three hundred years' growth. Last week they dug down into a new place, and about twelve feet below the surface found a mass of copper that will weigh from eight to ten tons. This mass was buried in ashes, and it appears they could not handle it, and had no means of cutting it, and probably built fire to melt or separate the rock from it, which might be done by heating, and then dashing on cold water. This piece of copper is as pure and clean as a new cent, the upper surface has been pounded clear and smooth. It appears that this mass of copper was taken from the bottom of a shaft, at the depth of about thirty feet. In sinking this shaft from where the mass now lies, they followed the course of the vein, which pitches oonsiderably; this enabled them to raise it as far as the hole came up with a slant. At the bottom of the shaft they found skids of black oak, from eight to twelve inches in diameter—these sticks were charred through as if burnt, they found large wooden wedges in the same situation. In this shaft they found a miner's gad and a narrow chisel made of copper. They have taken out more than a ton of cobble-stones, which have been used as mallets. These stones were nearly round with a score cut around the center, and look as if this score was cut for the purpose of putting a withe round for a handle. The Chippewa Indians all say that this work was never done by Indians. This discovery will lead to a new method ot finding veins in this country, and may be of great benefit to some. We suppose they will keep finding new wonders for some time yet, as it is but a short time since they first found the old mine. There is copper in abundance, and Knapp has found considerable silver during the past winter.

Here is evidence of a civilized race inhabiting this country when the land of our forefathers was nothing but a wild and bleak Island inhabited by our painted progenitors. Oh that printing had been known in the days of old. Well has the press been compared to a planet in our system.

The Influence of Rhythm.

The finer melodies of language will always be found in those compositions which deal with many considerations at once,—some principal, some subordinate, some exceptional, some gradational, some oppugnant; and deal with them compositely, by blending whilst they distinguish. And so much am I persuaded of the connection between true intellectual harmony of language and this kind of composition, that I would rather seek for it in an act of parliament—if any arduous matter of legislation be in hand—than in the productions of our popular writers, however lively and forcible. An act of parliament, in such subject matter, is studiously written, and expects to be diligently read, and it generally comprises compositions of the multiplex character which has been described. It is a kind of writing, therefore, to which some species of rhythmical movement is indispensable, as any one will find who attempts to draft a difficult and comprehensive enactment, with the omission of all the words which speak to the ear only, and are superfluous to the sense. Let me not be misunderstood as presuming to find fault generally and indiscriminately with our modern manner of writing. It may be adapted to its age and its purposes; which purposes, as bearing directly upon living multitudes, have a vastness and momentuousness of their own. All that it concerns me to aver is, that the purpose which it will not answer is that of training the ear of a poet to rhythmical melodies. And how little it lends itself to any high order of poetical purposes, may be judged by the dreary results of every attempt which is made to apply it to purposes of a cognate character—to prayers, for example, and spiritual exercises. Compare our modern compositions of this kind with the liturgy—a language which, though for the most part short and ejaculatory and not demanding to be rhythmic in order to be understood, partakes, nevertheless, in the highest degree, of the musical expressiveness which pervaded the compositions of the time. Listen to it in all its varieties of strain and cadence, sudden or sustained —now holding on in assured strength, now sinking in a soft contrition, anon soaring in the joyfullness of faith—confession, absolution, exultation, each to its appropriate music, and these again contrasted with the steady statements of the doxologies. Let us listen, I say, to this language, which is one effusion of celestial harmonies, and compare with it the flat and uninspired tones and flagging movements of those compounds of petition and exhortation (from their length and multifariousness peculiarly demanding rhythmic support), which are to be found in modern collections of prayers for the use of families. I think the comparison will constrain us to acknowledge that short sentences in long succession, however clear in construction and correct in grammar, if they have no rhythmic impulse—though they may very well deliver themselves of what the writer thinks and means—will fail to bear in upon the mind any adequate impression of what he feels—his hopes and fears, his joy, his gratitude, his compunction, his anguish, and tribulation; or, indeed, any assurance that he had not merely framed a document of piety, in which he had carefully set down whatever was most proper to be said on the mornings and evenings of each day. These compositions have been, by an illustrious soldier, designated "fancy prayers," and this epithet may be suitable to them in so far as they make no account of authority and prescription; but neither to the fancy nor to the imagination do they appeal through any utterance which can charm the ear.—*Henry Taylor.*

Petrifaction Ponds.

The following is a description of the petrifaction ponds at Shirameen, (a village near the lake of Ourmia in Persia,) which produce the transparent stone known by the name of Tabriz Marble.—This natural curiosity consists of certain extraordinary pools or plashes, whose indolent waters, by a slow and regular process, stagnate, concrete, and petrify, and produce that beautiful transparent stone, commonly called Tabriz Marble, which is so remarkable in most of the burial places in Persia, and which forms a chief ornament in all buildings of note throughout the country. These ponds, which are situated close to one another, are contained in the circumference of about half a mile, and their position is marked by confused heaps and mounds of the stone, which have accumulated as the excavations have increased. On approaching the spot, the ground has a hollow sound, with a particularly dreary and calcined appearance, and when upon it, a strong mineral smell arises from the ponds. The process of petrifaction is to be traced from its first beginning to its termination. In one part, the water is clear; in another, it appears thicker and stagnant; in a third, quite black; and in its last stage, it is white, like a hoarfrost. Indeed, a petrified pond looks like frozen water, and, before the operation is quite finished, a stone slightly thrown upon it breaks the outer coating, and causes the black water underneath to exude. Where the operation is complete, a stone makes no impression, and a man may walk on it without wetting his shoes.

Wherever the petrifaction has been hewn into, the curious progress of the concretion is clearly seen, and shows itself like sheets of rough paper placed one over the other in accumulated layers. Such is the constant tendency of this water to become stone, that where it exudes from the ground in bubbles, the petrifaction assumes a globular shape, as if the bubbles of a spring, by a stroke of magic, had been arrested in their play, and metamorphosed into marble.

The substance thus produced is brittle, transparent, and sometimes most richly streaked with green, red, and copper-coloured veins. It admits of being cut into immense slabs, and takes a good polish. The present royal family of Persia, whose princes do not expend large sums in the construction of public buildings, have not carried away much of the stone; but some immense slabs which were cut by Nadir Shah, and now lie neglected among innumerable fragments, show the objects which he had in view. So much is this stone looked upon as an article of luxury, that none but the king, his sons, and persons privileged by special firmen, are permitted to excavate; and such is the ascendancy of pride over avarice, that the scheme of farming it to the highest bidder, does not seem to have ever come within the calculations of its present possessor.

Coal.

Mineral coal dug from the earth is organized carbon buried in ancient reeds and forests by the sinking down of the crust of the planet at particular points, and the washing in of earthly sediments above the submerged forest, to be consolidated into stratified or sedimentary rocks. The prodigious force of volcanic power, acting from below, upheaves all these strata, their cracks and wide fissures are washed into valleys by the ceaseless action of rain, frost, electricity, light, heat, and other meteoric influences; and thus they wear down solid rocks to coal beds, and often far below them.

Carbon is the *coal* which may be obtained alike from wood, straw, grain, flesh, and almost, if not quite every truly organized product of life. There is carbon enough in the carbonic acid which is chemically combined with lime in limestone rock, to cover the whole globe with a pure diamond 500 feet in thickness. While an immense quantity of carbonic acid is discharged into the atmosphere from volcanoes and internal heat, acting like fire on limestone in a burning kiln, by which 100 lbs. of rock lose 44 lbs. of gas; yet old ocean keeps up nature's great balance, by absorbing an equal quantity of carbonic acid gas to combine with the store of the earthy minerals below.

Brazil.

In the Empire of Brazil in which abounds the finest Iron Ore, there is not a single smelting furnace, notwithstanding the very considerable incursion that French and English Capitalists have made there. There are several foundries for the manufacture of machinery, but the iron for that purpose is wholly imported. Some enterprising American capitalists and mechanics of this city contemplate establishing an extensive smelting furnace in the Brazilian province of Rio Grande near the river of that name, during the coming year. This will be the first enterprise of the kind in South America, and while it will unquestionably prove immensely profitable, will be one more evidence of Yankee go-ahead-ativeness. Americans were the first to introduce steamers to the navigation of Central American rivers, they will soon build them by the aid of native furnaces and foundries, within sight of the Patagonian huts of South America.

Danger of a Cent.

On the 17th day of September, 1847, a lad 7 years of age, son of Mr. Theodore P. Bowker of Boston, accidentally swallowed a copper cent, which lodged at the entrance of his stomach. Medical aid was immediately called, and although the physicians could distinctly feel it with their instruments, all efforts to extricate it were unavailing. The lad suffered great inconvenience in consequence of its remaining where it first lodged, and has frequently abstained from eating his regular meals, such was the distress occasioned by food coming in contact with the piece of copper. Thus the matter continued until the evening of the 17th inst. a period of ten months, when he was suddenly seized with a violent vomiting, and among other matter, threw up the aforesaid cent, which was covered with a thin firm scaly substance.—The little fellow is now as healthy as ever, and feels greatly relieved at having disgorged the indigestible coin