

## Arts, Manufactures and Machinery.

*Accuracy of different kinds of work, and of copying.*

The accuracy with which Machinery executes its work, is, perhaps one of its most important advantages; it may, however be contended that a considerable portion of this advantage may be resolved into a saving of time.

It generally happens, that any improvement in tools increases the quantity of work done in a given time. Without tools, that is, by the mere efforts of the human hand, there are, undoubtedly, multitudes of things which it would be impossible to make. Add to the human hand the rudest cutting instrument, and its powers are enlarged; the fabrication of many things then becomes easy, and that of some possible with great labor. Add the saw to the knife or the hatchet, and other works become possible, and a new course of difficult operations is brought into view, whilst many of the former difficulties are removed. This observation is applicable even to the most perfect tools or machines. It would be possible for a very skillful workman with files and polishing substances to form a cylinder out of a piece of steel, but the time which this would require would be so considerable, and the number of failures would probably be so large, that for all practical purposes such a mode of producing a steel cylinder might be said to be quite impossible.

The same process by the aid of the lathe and the sliding rest, is the everyday employment of hundreds of workmen.

It is more easy to make a good circle, than to produce a straight line. Of all the operations of art, that of turning is the most perfect. If two surfaces are worked against each other, whatever may have been their figure at the commencement, there exists a tendency in them to become portions of spheres. Either of them may become convex, and the other concave, with various degrees of curvature. A plain surface is the line of separation between convexity and concavity and is most difficult to hit. A similar difficulty takes place in figuring specula for telescopes; the parabola is the surface which separates the hyperbolic from the elliptic figure, and is the most difficult to form. If a spindle not cylindrical at its end is pressed into a hole not circular, and if the spindle be kept constantly turning, there is a tendency in these two bodies so situated to become conical, or to have circular sections. If a triangular piece of iron be worked round in a circular hole, the edges will gradually wear, and it will become conical. These facts, if they do not explain, at least illustrate the principles on which the excellence of work formed in the lathe depends.

The operations of printing the Numbers on Bank-notes is one which requires perfect accuracy: and although each number differs from all the others, it is accomplished by a few wheels.

The two last sources of excellence in the work produced by machinery depend on a principle which pervades a very large portion of all Manufactures, and is one upon which the cheapness of the articles produced seems greatly to depend. The principle to which we allude is the system of copying; taken in its most extensive sense. Almost unlimited pains are, in some instances, bestowed on the original, from which a series of copies are to be produced; and the larger the number of these copies, the more care and pains can the manufacturer afford to lavish upon the original. It may thus happen, that the instrument, or tool actually producing the work, shall cost five or even ten thousand times the price of each individual specimen of its power.

As the system of copying is of so much importance, and of such extensive use in the Arts, we shall endeavor to classify a considerable number of those processes in which it is employed: not, however, pretending to give a complete list, and restricting ourselves to the shortest possible detail which will be consistent with a due regard to making the subject intelligent.

Operations of copying take place under the following circumstances; by Printing—by Casting,—by Moulding,—by Stamping,—by Punching,—with elongation,—with altered dimensions.

In our next we will refer to the different kinds of copying by printing.

### Foreign Correspondence.

**Gutta Percha.—Improvement in Lighthouses.—New Safety Lamp, &c. &c.**

LONDON, JULY 1, 1848.

There seems really to be no end of the application of Gutta Percha to the manufacture of articles both of utility and ornament. It is now made here into Harness of the most beautiful description, which is impervious to water, and neither cracks nor needs grease of any kind to keep up its flexibility or appearance. Stitching in harness being always the first to decay, it is altogether dispensed with in the gutta percha harness, and thus strength and economy are secured, and, being lighter than leather, almost imperishable. It can also be readily cleansed with a sponge and water. Some of this kind of harness has been severally tested for some months by omnibus wear and tear, as well as on private carriages, and its economy over all kinds of leather harness, as well as its durability and beauty, put beyond question. In addition to harness, it is now being made into highly finished walking sticks, cricket and other balls, picture frames, fruit dishes, inkstands, trumpets and tubes for the ear, mouldings and ornaments of all kinds for architectural and other decorations, police clubs, pump buckets and substitutes for leather to hydraulic presses; colored thread, flat and round, rope and round band all sizes, from 1 to 2000 feet in a coil, thin sheet for milliners, dressmakers, hat, cap and bonnet manufacturers, tubing any diameter and thickness, forming any angle or curve, and unaffected by gas, alkalies, acids or other fluids.

An improvement in lighthouses has recently been invented here, which is calculated to render them better adapted to the purpose for which they are intended. The inventor proposes to construct a sort of chamber beneath the lantern of the lighthouse, by cutting four or more circular apertures in all the present edifices, and fitting them with sashes of ground plate glass. Upon each of these glazed sashes, looking seaward, he proposes to paint a large initial letter, the length of which shall be double the size of the light displayed in the lantern above. The chamber would at night be illuminated by a lamp, which would render the initial letter visible at a very great distance. By day the letter would also be visible, and would serve to distinguish one light house from another.

A Rev. Gentleman of Huddersfield, Yorkshire, (Rev. W. Thorp,) has invented a new safety lamp, which will effectually remedy all the defects in the lamp of Sir H. Davy; affording five times more light, and being perfectly safe in every condition of the coal mine. The lamp received the unqualified approbation of a great number of persons, nine of whom were coal owners, or viewers of collieries, and more conversant with fire damp, than, perhaps, any other persons in Yorkshire. Two great defects exist in the old lamp of Sir H. Davy—first, it affords too little light, and therefore the miners frequently prefer to work with a candle in danger rather than use it; secondly, it is not safe, and the Miners' Association of New Castle have just published "an exposition of the insecure nature of the Davy and other lamps as applied to coal mining." In order to obtain more light, Mr. Thorp introduces, with considerable ingenuity, the argand, or rather the solar burner, characterized by the circular wick, and the air admitted through its centre from the bottom of the lamp, protected, of course, by gauzes of wire. Connected with this part of the lamp is an adjustment, placed outside of the cistern, by which the wick can, with the greatest ease, be raised or lowered. Over the light is applied a chimney of iron, based with a few inches of glass, with air admitted to supply the exterior of the flame from the inside of the lamp. This is so securely fixed, that it cannot be displaced or broken from the ordinary falls or minor casualties to which these lamps are liable to be exposed. Having obtained the great desi-

deratum, viz: a much higher illuminating power, or more than five times the quantity of light the Davy lamp affords, or that equal to two mould candles generally used by miners, the next object being to ensure perfect safety in every condition of the mine, there are inserted into the chimney four or five chambers of wire gauze; so that the flame of ignited gas has to traverse eight or ten meshes before it can possibly reach the exterior fire-damp; but as one mesh, as in the old lamp, is perfectly safe, unless exposed to a current, and as no lateral current of gas or air can be exerted upon the flame on account of the chimney, the lamp is perfectly safe. And it is found, by any artificial means, utterly impossible to pass flame through these chambers of gauze, so that it appears to be quite safe under every circumstance and condition of the mine. There are other advantages over the Davy lamp of no inconsiderable value:—1. It requires trimming only once a week: 2, the oil does not fall out if laid on one side: 3, it is much more easily cleaned; 4, the cheapest oil can be used in it.

The inventor has refused to take out a patent for this lamp, and gives it for the public benefit.

Some of our wise heads have been discussing the originality of the use of ether and chloroform, and have come to the conclusion that the use of these agents is about "as old as the hills." One lecturer a few evenings since told us that ether was identical with the *nepenthe* of Homer, which Helen put into the bowl to cheer her guests; and which, according to Pliny, was a kind of herb, or extract from a herb, which when put into wine, drove away sadness. And chloroform, he insisted, was nothing more than the sweet "oblivious antidote" of Shakspeare.

Among the "fancy" articles brought out recently, I notice "A blessing to Mothers," in the shape of a new article of grub for children calculated to do away with the milk system; "Homoeopathic Cocca;" the "Patent Soutenir," a new article of table cutlery for eating asparagus; patent belt-band spring drawers and pantaloons; also, breeches upon "a new principle." The drawers are "warranted to prevent rupture and check corpulency!" a stock of which ought certainly to be provided at the public expense for the special use of your "City Fathers," as they could then "pile it in" without the slightest fear of a collapse.

The state of Mechanics and the Fine Arts throughout the whole extent of the convulsed Continent, presents at present the most uncheering aspect. The struggle for freedom engrosses the thinking as well the physical energies of all ranks and conditions of men.

The most unequivocal symptoms of the potato rot have again made their appearance in some parts of this country.

Yours, &c.

M. R.

### The Dismal Swamp.

The Dismal Swamp in Virginia and North Carolina is a fearful place. It is full of wild birds, wild beasts, reptiles and runaway negroes. Huge bull-frogs, nearly as large as a man's foot, with smaller specimens of the same genus, open a "grand concert" every night. Great indolent herons and other aquatic birds, too lazy to take a fish, unless he jumps out of his own accord, sit round on the trees. Dense swarms of musquitoes, ephemera and sandflies fill the air. At about sun down and after, all the animal life is in motion. Every throat is open. The croaking of the bullfrogs, buzzing of insects, cooing of turtle doves, and the sounds from a thousand musical instruments, pitched on as many different keys, make an assemblage of harmony and discord that defies description. The vegetation of the Swamp is more luxuriant than can be seen in any part of the world. The timber is pine, oak, sweet gum, black gum, holly, the beautiful tulip tree, the cypress, loaded down with its festoons of moss, the misletoe bough in dark green bunches growing about on many different trees, with different kinds of timber. Immense canebrakes, so thickly interwoven with vines that one might about as well attempt to walk through a brick wall as to force his way through. A canal is made through the swamp, and, part of the way, it goes through the lake, and on its banks runs

the stage road. Snakes, lizards, scorpions, chameleons, and other loathsome reptiles, abound in great numbers.

### The Prussian Parliament.

The deputies receive an allowance of three thalers (nine shillings) per day, and their travelling expenses. To some of the peasant representatives the allowance is indispensable for the journey. One of the deputies is a day laborer, a *proletarier*, but the great majority of the chamber consists of men in easy, if not wealthy circumstances. Even those classed as "peasants" are mostly occupiers of land—what we should call small farmers. One hundred and twenty-nine deputies are persons holding offices, either of the state or the municipalities; most of these are jurists or lawyers; there are forty-one clergymen; merchants and manufacturers, thirty-one; teachers and *Gelehrte Savans*, or it may be assumed, professors, twenty-seven; landed proprietors, twenty-six,—of these only three are holders of privileged estates (Rittergut,) which, have formerly belonged to the domains of one of the class of nobles, are still almost exempted from taxation; mechanics, seventeen; magistrates seventeen; physicians ten, military officers four; a prince of the reigning house, and four of the ministers; peasants, forty-five; agriculturists, or renters of larger parcels of land, five; two shopkeepers, one agent, one land surveyor, one day-laborer, and a town councillor. Of thirty-nine deputies, there is no special description; from the class of nobles there are twenty-four deputies returned. The majority of the peasant representatives (twenty-nine) have been elected in Silesia.

### A Gentleman.

Did you ever see a gentleman? We have seen two or three in our day, but real gentlemen are very rare. A gentleman is one who treats every body with respect, whether he be black or white, low or high, poor or rich. He does not bow to wealth, scrape his knees to honor, nor holds his tongue when he sees wickedness in high places. You always receive from him a civil answer to your enquiry, and he kindly imparts to you any information in his power. He will not say a word to injure your feelings, or allude to a subject to pain your heart. Whatever may be done he will not manifest angry feelings, or use unbecoming language. He uses no profane or indecent words, smokes no cigars in your presence nor spits tobacco juice on your floors. He is the same kind and accommodating individual, from one week's end to another.

### Three Poets in a Puzzle.

I led the horse to the stable, when a fresh perplexity arose. I removed the harness without difficulty, but, after many strenuous attempts, I could not remove the collar. In despair, I called for assistance, when aid soon drew near. Mr. Wordsworth brought his ingenuity into exercise, but, after several unsuccessful efforts, he relinquished the achievement, as a thing altogether impracticable. Mr. Coleridge now tried his hand, but showed no more grooming skill than his predecessors; for, after twisting the horse's neck, almost to strangulation, and the great danger of his eyes, he gave up the useless task, pronouncing that the horse's head must have swollen from gout or dropsy, since the collar was put on; 'for,' he said, 'it was a downright impossibility for such a huge *os frontis* to pass through so narrow a collar!' Just at this instant, a seryant girl came near, and understanding the cause of our consternation, 'La, master,' said she, 'you don't go about the work in the right way. You should do like this; when, turning the collar completely upside down, she slipped it off in a moment, to our great humiliation and wonderment: each satisfied afresh, that there were heights of knowledge in the world to which we had not yet attained.—*Life of Coleridge.*

It is just so throughout all the gradations of Society, the highest are indebted to the lowliest, and there is but precious little difference between the king and the countrymen, and that difference is in favor of the latter, for the former is an artificial nobleman, and the latter one of nature's nobility.