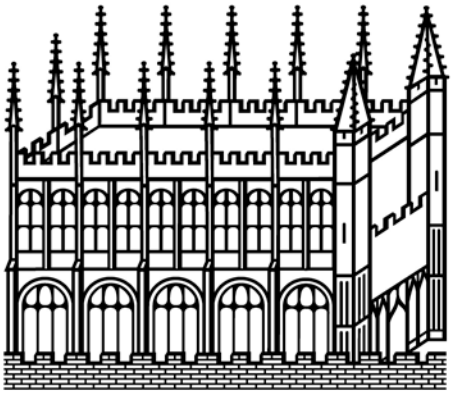

The Book of Trades by Peter Parley

THE UPHOLSTERER.

THE BOOK

OF

Trades, Arts, & Professions,

RELATIVE TO

FOOD, CLOTHING, SHELTER, TRAVELLING, AND ORNAMENT.

FOR

THE USE OF THE YOUNG.

By PETER PARLEY.

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PREFACE.

THIS little work is compiled with a view to brevity; for, as this is the soul of wit, so should it be the soul of all that is written for children. As the beard of Polonius, so are most books; but to Peter Parley "brevity" is the first of graces. Brevity, therefore, is the distinguishing feature of "The Book of Trades, Arts, and Professions," which presents to the youthful reader

exactly so much as he ought to be acquainted with and no more. It comprehends all the more useful trades, and embraces the most modern improvements and modes of manipulation, and cannot fail to afford much amusement as well as instruction.

P. P.

CONTENTS.

THE MERCHANT.

THE BOOK

OF

Trades, Arts, and Professions.

THE MERCHANT.

ONE of the most honourable characters in the whole civilized world is the British merchant. It is to his high integrity, honesty, and punctuality that England is indebted for her national supremacy, and we may be sure that so soon as his sterling character decays, England will decay also.

A merchant, in the true sense of the word, is one who exchanges the commodities of one country for those of another. He may not do this exactly by barter; but he buys goods abroad, and brings them home, or he sells goods at home to people abroad, and this he manages to do by means of certain agencies and by the substantial character which he bears as a man of money and principle.

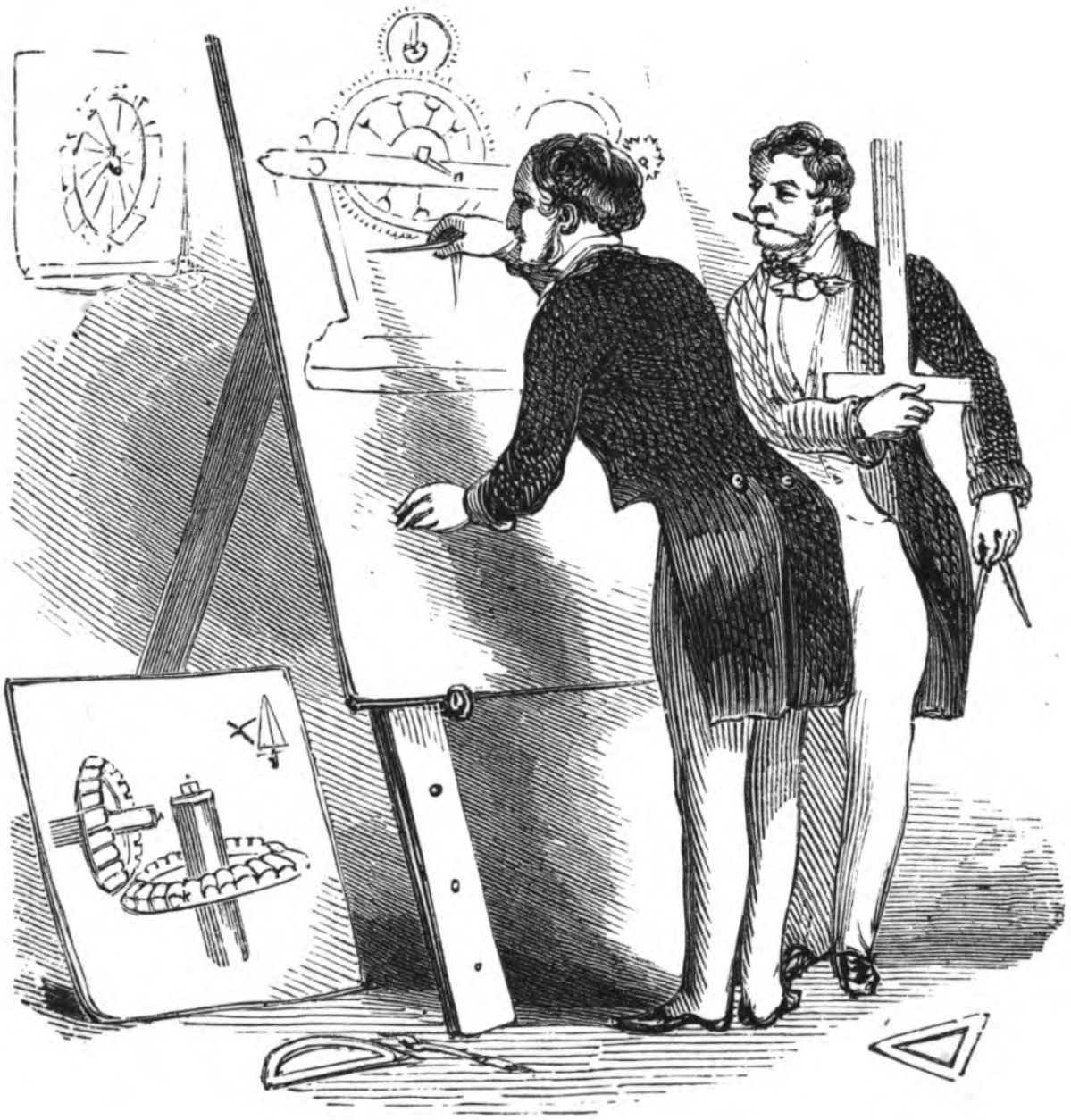
The commodities which a merchant sends to other countries are called exports, and those which he brings from other countries to his own are called imports. The British merchant exports woollens, calicoes, hardware, and ironwork; and imports tea, sugar, cotton, tobacco, hemp, and many other things. For these he pays money, or gives bills at certain

dates, which he is bound to meet when they become due.

A merchant's counting-house is a model of order, exactness, and precision. All the books in which the merchant's dealings are recorded, are methodically kept, and the entries written in a nice, clean, bold hand. Everything is indexed, so that a person wishing to know when any transaction took place, and the particulars regarding it, has nothing to do but to refer to it, and he can turn to the other books and find it there recorded. The same certainty prevails also with regard to money matters. The merchant can in a moment ascertain the exact state of his accounts, the moneys paid during the year, the credits taken, and the credits given, the bills payable, and the bills re-

ceivable, and the stock in hand, and the value of it, with every liability, and a moderate calculation concerning contingencies.

All young persons should learn to keep correct accounts. By habituating themselves in early life to take note of how the money comes and goes, they will lay the foundation of wealth and prosperity in after life. Very few persons who have kept correct accounts have ever been known to come to disgrace or poverty; while those who have been irregular or slovenly in their accounts have in general become bankrupts.



THE ENGINEER.

THE ENGINEER.

THE engineer is a very important man nowadays. It is to him we have to look for all great improvements on a large scale, such as the construction of railways, the forming of docks, the making of canals, and, what is of no less importance, the building of forts and harbours.

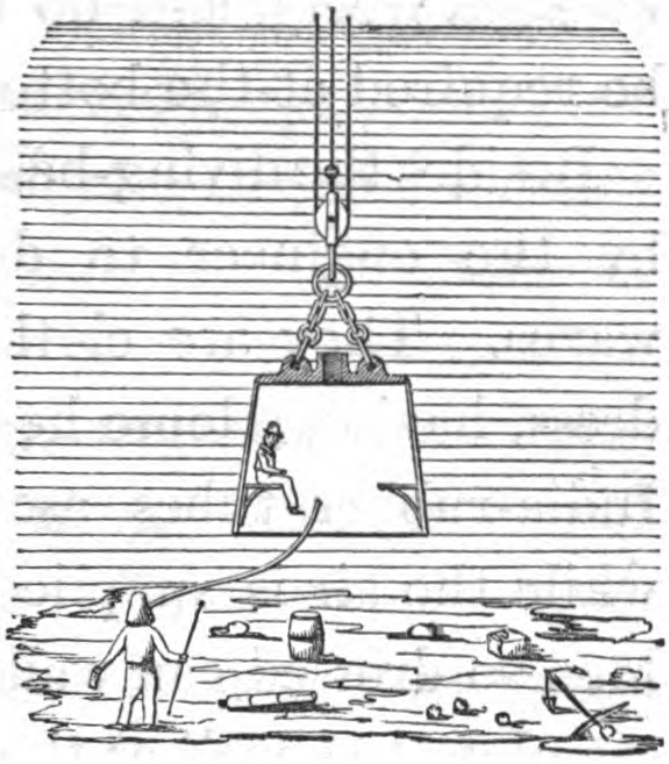
When the engineer has to make a railway, he first surveys the line, takes all the bearings and all the levels of the intended route. He makes also very accurate returns of the nature of the soil, rock, sand-stones, lime-

stones, or other hard substances he has to penetrate, and then he considers the kind of machinery, manual labour, or horse power, which is necessary to be employed, and sets to work.

Harbours are, as I said, the work of the engineer. Harbours are formed to shelter ships from the fury of the sea in bad weather. In making a harbour the engineer usually selects some place sheltered in part from the sea and wind by nature, and to protect it still further he throws out strong bulwarks of stone, running out into the sea and curving in such a way as in some degree to enclose the harbour. The enclosure is made by piers, moles, and breakwaters.

The engineer very frequently makes use of the diving-bell. This is a very useful

machine, as it enables the engineer to work under water, and thus to lay the foundations of piers or breakwaters. We can easily illustrate the principle of the diving-bell by a glass tumbler. If this be inverted in a basin or tub of water, it will be found that the water will not rise more than three parts of the way in it, owing to the air which it contains.



A diving-bell, instead of being of glass, is a large iron vessel capable of containing one or more persons. Air is pumped from above by means of a forcing pump, and the persons

within are thus supplied with air, can breathe freely, and do whatever work may be required at the bottom of the sea.

Besides the diving-bell, divers are employed by the engineer to descend beneath the waves. They are clothed in a water-tight dress, having a loose head-piece, from which India-rubber tubes ascend to the surface, while the air is supplied by a forcing pump. Men so dressed can walk at the bottom of the sea almost as well as they can on dry land.

The engineer uses great art in the construction of canals. A canal may be termed an artificial river cut through a level country to admit, generally, boats and barges, but sometimes ships. The great difficulty in planning it is to run as level a line as possible. The banks are either of stone or earth

thrown up into mounds; water is supplied from lakes and rivulets, and is permitted to escape by means of sluices.

Canals often pass through hills by means of tunnels, and are carried over rivers by aqueducts; and vessels are towed along their sides by horses which run upon the banks. Engineers have frequently tried to apply steam power to ships or boats upon canals, but without success, as it has been found that the agitation of the waters by the paddles of the steamers soon breaks down the banks of the canals.

Canals are numerous in this country, and still more so in Holland. Some of those in England cost a great deal of money. It is supposed that the canals of England have cost upwards of a hundred millions of pounds.

THE MALTSTER.

MALTING AND BREWING.

MALTING.

As brewing depends upon malting, we must, to enable us to understand the latter process, explain the former.

To make beer we must have malt, and malt is made from the corn called barley. Unless this is well made, the beer brewed from it will be very poor stuff.

The principle of malting is as follows. It is found that the seeds of all plants are con-

verted into sugar by germination. When a seed is put in a damp place, it begins to sprout; at the same time the floury part of the seed is converted into a sweet substance called saccharine or sugar-like; this sweet substance has the power of causing water to ferment, and beer is what is called a "fermented liquor."

Malting therefore is the preparation of barley in such a manner that the farina or starch of the seed shall be converted into sugar, and this sugar employed in brewing.

The first part of the process is to steep the seed in water, in order to soften the husk, &c., and thus to admit of the radicle or rootlet of the future plant to force its way through them, just as it would do

in a natural state by the moisture of the earth.

Barley, according to the season and other circumstances, is steeped in water from forty to sixty hours. When the seed is sufficiently saturated the water is drained off, and the barley is put into shallow chests called *couch frames*, where it remains for four days, during which time it begins to *sprout*, and heat is evolved, or the grain sweats, as it is technically termed. It is then spread out on the floors of a large long low-roofed building, called a malt house, in thin layers of about three or four inches, everywhere of an equal depth, and narrow walks are left to admit of persons getting to every part of the layers, in order to turn them, so that every grain may be equally heated by the

chemical process accompanying germination, so as to yield an equal proportion of saccharine or sugary matter.

The time the barley remains on the floors of the malting house depends upon the season of the year, and varies from fifteen to twenty days. Every part of the process requires much care and judgment. The object is, that the germination of the grain shall have proceeded as far as the plumule, or little plant, may be just about to pierce through the coats of the seed; and this does not happen till the radicle, or root, is half an inch in length. If the plumule were suffered to appear externally, the point of greatest "*sweetness*" will have passed.

When, however, this precise point is attained it is suddenly to be stopped, and the

grain is spread on the floor of a kiln to be dried, that its vitality may be destroyed by the heat.

A malt kiln is of the form of an inverted cone. At the widest or upper part there is a floor of tiles or of iron plates pierced with small holes to allow the heat of a fire kindled below to arrive at and penetrate the layer of malt, which is spread on the floor to the depth of four or five inches. The heat, which ought to be moderate, is to be continued till all the moisture is dried up, and the grain is toasted brown, and all germination destroyed. According to the colour acquired in drying, malt is distinguished by the terms *pale*, *brown*, *high dried*, &c. The best kind of malt is of a pure, bright, pale colour; and to produce this colour upon inferior malt,

the roguish "maltsters" put a little brimstone on the fire of the kiln, which bleaches the outer husk of the barley, and thus bad malt is made to pass for good. The colour of the beer is light or dark according to the kind of malt from which it is brewed; thus, Lockwood's crystal ale is brewed from the finest pale malt, and porter from "brown malt."

THE BREWER.

BREWING.

BEFORE the malt can be used it is *ground* or crushed. This operation must be performed with care. If the grain be reduced to too fine a powder, it clogs or forms a paste with the water in mashing. If, on the other hand, the skin or shell of the seed be not sufficiently broken to detach it from the farina within, all the goodness of the malt will not be extracted in the next process.

This is called *mashing*, and consists in making a decoction of the malt in hot water, for the purpose of dissolving all the saccharine

matter. To produce this effect the water must not be boiling. The precise degree of temperature depends upon the kind of malt; from 170 to 190 degrees of Fahrenheit may be considered as the limits.

The mashing is done in a vessel called a mash tub, and while the grain is soaking, it requires to be well stirred about; for if it were not, the malt being heavier than water would lie at the bottom, and only the upper part of it be acted upon by the water. In small brewings, the stirring is done by hand by means of a mashing stick; but in large breweries this work is done by machinery, and there is a plan by which the water is let into the malt from the bottom of the mash tub or vat, which does away with the "stirring up" of the malt altogether.

The water, when it has dissolved the saccharine matter of the malt, is called wort, and in order to draw it off clear from the grain the mash tub is made with a double or false bottom. The upper one, being perforated with small holes, acts as a sieve, and strains the wort, the tap being inserted between the two bottoms. The wort is of a sweetish taste, and of a somewhat sickly flavour.

The first quantity of wort being drawn off, more hot water and of a higher temperature is poured on the grains, and left to stand a longer time; by this, a farther portion of the sugar is obtained from the malt, but is not so strong. The malt is sometimes submitted to a third watering, but the "thirds" is poor stuff.

From the mash tub the wort is received into another vessel, and from this it is pumped into the copper to be boiled, and a proper quantity of hops is put into the copper to be boiled with it. When it has boiled for about an hour, the mixture is drawn off from the boiler into a vessel called the cooler. This, in small breweries, is a wide and shallow vessel placed in a cool situation so that it may become cool as soon as possible. When its temperature is reduced to about 60 degrees, it is allowed to run into the fermenting vats; and now a proportion of yeast is added, which sets the whole into a state of fermentation. This chemical action causes a froth to rise on the surface, and more yeast is engendered. When this fermentation begins to subside, the yeast

is skimmed off, and the liquor is put into casks, and is then termed "beer."

After the beer is in the cask it still continues to work and throw off foam or yeast, but after a time this fermentation subsides, and then the bung is driven into the cask, and the process of brewing is concluded; but a considerable time must be allowed to pass before the liquor is drunk. The object of the delay is to allow the fermentation to subside completely, and for the beer to fine itself and become clear.

The "beer" brewed by honest brewers is the best, and home-brewed beer made from pure malt and hops is the next best. The beer we have from public houses and beer shops is generally diluted with water drugged with nux vomica to make it heady, mixed

with "green vitriol," "heading," and a variety of infamous compounds, which frequently produce a temporary madness in the poor wretches who are forced to drink it. Numerous crimes are daily committed under the influence of this *drugged beer*, and the legislature ought to interfere and test the beer of the publican, from time to time, by such scientific means as might be made available.

THE BAKER.

THE miller grinds the corn sent to him, and sorts the flour into three qualities, called *firsts*, *seconds* and *thirds*. The first is employed for French bread, dinner rolls, and the best cakes and pastry. *Household bread* is made from a mixture of firsts and seconds. *Brown bread* is made from a mixture of the better bolted flour and some of the meal as it comes from the grindstones.

Bakers make bread of flour, water, salt, potatoes, alum, and other ingredients, such as bean meal, or pea meal, and then sell it as pure. Some bakers, who are very con-

THE BAKER.

scientious and who will not put alum or pea meal into their bread, buy it already mixed of the mealmen, and say they do not know anything about it.

People who make their own bread—and everybody ought to do this if they can, and to grind their own wheat also if possible—make it of flour, yeast, salt, a few potatoes, and water. The potatoes are steamed till they are mealy, and are then pounded fine. This meal is mixed with cold water to the consistence of cream, and being made to ferment by the addition of yeast, it is added to the flour in the process of making the bread, which I will describe to you.

When bread is made in a large way, the following is the process. The necessary portion of yeast is diluted with hot water, till

the mixture is of the temperature of 100 degrees. Some salt is then added, and the liquor poured into a wooden kneading trough. One third of the whole quantity of flour about to be made into bread, is first mixed with the liquor, being well worked with the hands until it is thoroughly combined and free from lumps. When this is the case the trough is covered up closely, and the mixture is left for several hours, during which time a fermentation commences, and the mass swells. When this has arrived at the proper stage, the whole is gradually incorporated with a new quantity of cold or lukewarm water, according to the season of the year. The remainder of the flour is then added, and the whole worked together into a stiff paste called

dough. The dough is now left for an hour or two till it *rises*, as it is called, that is, till it puffs up and swells again. When it becomes sufficiently light and spongy, it is made up into loaves and put into the oven.

The oven is a chamber built of fire-bricks, and having an arched roof, or dome, with a flat floor of tiles. It is generally under ground. The oven is heated by firewood of some kind. A quantity of small brushwood, with larger logs and billets of wood, is piled up on the oven floor and set on fire. When thoroughly lighted the door of the oven is closed, a small aperture being alone left to supply air, and as soon as the fuel is burnt out, the ashes are hastily swept away and the bread is put in.

The loaves of bread are placed regularly

on the tile floor, touching each other, the largest size being put in first to give them more time to bake. When the oven is filled the door is shut, and the heat kept up for two hours, which time is sufficient for ordinary-sized loaves.

The loaves touching each other are not browned or made crusty on their sides which are in contact; and the bottom, which rests on the tiles, although more heated than the sides, is less crusted than the top, which alone is exposed to the full heat. These are the causes of the difference in appearance of the upper and under crusts.

Biscuits differ from bread in being made without yeast or leaven, and the dough is kneaded very stiff by being trampled upon with the *feet*, or worked with a wooden roller.

THE GROCER.

THE GROCER.

THE grocer is generally a sharp, neat, dapper man—a man of business; he knows how to buy and how to manage his stock by mixtures, additions, and manœuvres, so as to get a profit by it.

The grocer buys and sells tea, sugar, spices, coffee, and such articles; but in country towns the grocer, as he is called, very often sells soap, candles, treacle, and brick-dust.

Tea is the dried leaves of an evergreen shrub, common to Japan, China, and Siam.

It resembles in appearance the Camella Japonica. The flower is like that of the wild rose, and its root like that of the pear tree. It was first introduced into Europe in the year 1660.

The various kinds of tea, such as Bohea, Hyson, Souchong, Gunpowder, Pekoe, do not come from the same kind of plant. Bohea, or black tea, has a flower with six petals, and that which produces the green tea has one with nine. The plants or shrubs are in their highest perfection when about three years old. The leaves are plucked from the plant; the young leaves and those at the extremities of the branches are the best, and make the most valuable teas, such as Pekoe and Souchong.

After the leaves have been plucked and

dried, they are cast upon porcelain or iron plates to curl them, and are afterwards packed in chests for exportation.

Sugar is another chief article of the grocer. It is the produce of a plant called the sugar cane, brought from China to the West Indies, and belongs to the tribe of grasses. It is about ten feet high, and about two inches in diameter. The canes are planted from slips, and at the end of ten months become large plants and quite ripe, and full of a rich, sweet, juicy matter. They are then cut down, crushed in a mill and afterwards boiled, the sweet liquor being clarified. This crystallizes on cooling, and is put into hogsheads and exported.

The grocer does a great deal of business in coffee. It is the berry of an ever-

green shrub which grows in Arabia and the East and West Indies. It is about ten feet in height, and its berry, when ripe, is red and not very unlike our cherry. At the proper time the fruit is gathered, dried in the sun, and the berries extracted by the help of mills; these are again dried and afterwards roasted, ground, and boiled in water. The finest coffee comes from Mocha, in Arabia, and was first drank in London in 1652.

Cocoa and chocolate are grocers' articles. The former is the produce of the cocoa tree of the West Indies. Chocolate is made from the nuts of the cocoa, by grinding them into a powder and mixing this with spices, sugar, and water, into a paste, which is afterwards moulded into cakes and dried.

The spices sold by the grocer come from various places, but generally from hot climates. Cloves are the flower-bud of the clove tree, a native of the Malacca Islands. Nutmegs are the kernels of the fruit of the nutmeg tree. Mace is a kind of filament which incloses the nutmeg. Cinnamon is the bark of the young shoots and branches of a tree which abounds in Ceylon, Java, and Borneo. Pepper is the berry of a creeping kind of shrub that grows in the East Indies. All-spice is the berry of the pimento shrub. Anniseeds are the seeds of an annual plant which grows wild in Egypt, Syria, and other eastern countries. Ginger is the dried root of a reed-like plant.

Grocers sell figs and olives. The fig-tree

abounds in Turkey, and is both wild and cultivated in gardens. The fruit is prepared for the grocer by being first dried in the sun and afterwards dipped in a scalding ley made from the ashes of the fig-tree. They are then packed in boxes called drums. Olives grow principally in the south of Europe, and large quantities are used for the making of olive oil, which the grocers sell at an enormous profit.

THE FISHMONGER.

THE FISHMONGER, POULTERER, ETC.

THE fishmonger and poulterer are in London frequently united in one person. In the country it is often the same. Fish are despatched from London by rail to various inland towns, from the market at Billingsgate; and also from various sea-ports in the vicinity of fishing stations, to the inland towns adjacent.

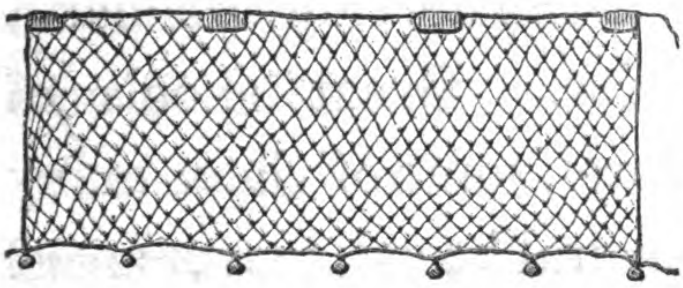
Enormous quantities of fish are daily brought to London from the fishing stations

on the coast, a great portion of which is consumed in the metropolis. It is a very exciting sight to be at Billingsgate market very early in the morning. Here you will see numerous boats unloading their fish—crabs, lobsters, soles, codfish, haddock, skate, salmon, oysters, shrimps, prawns and various other fish—and hundreds of men bringing them ashore to the " factors " in the market; an enormous crowd of buyers' and sellers' carts from every part, ready to take the fish bought to different fishmongers, and great numbers of huxters' carts belonging to men who hawk it about the streets.

The whole of this business is conducted with little confusion.

Fish are caught in the sea—in rivers—in lakes—in ponds and in brooks. They are

caught by nets or by lines. The net consists of a web of cords, sometimes many hundred feet in length, and from six to twelve broad. The cords are knitted across each other, leaving spaces too small to admit the fish to pass through them, and where they get entangled by the gills. The nets have corks at the top to float the top part, and little bits of lead to sink the bottom part, by which means it hangs suspended in the water, as you see it in the cut. It is then



dragged along by a boat at each end, or by one end being made fast by an anchor, while the boat drags the other, and the caught fish are brought to the boat or to the shore.

In line fishing a hook is fastened to the end of a line, baited with a piece of meat or a small fish; by these means the fish swallow the bait, hook and all. The hook sticks in their throats, and being *barbed* will not slip out again, and the fish are pulled by it out of the water. Here is the picture of a hook.

In large fisheries many hundred boats go out at a time to catch fish, such being particularly the case in the herring, pilchard, and mackerel fisheries. Great shoals of herrings and of mackerel, some of them many miles in length and several broad, traverse our coasts at certain seasons of the year. Then it is that the fishermen man all their boats, and go out in great numbers with their nets

to take them. Many hundred millions of fish are taken in this manner every year, and a great portion of the people of this country are supported by them.

Salmon fishing is carried on chiefly in the streams of the more northern parts of England, and in Scotland. Salmon is an important article of commerce, and is sent to distant parts of the country packed well.

Salmon is considered as one of the best fish for the table. It is taken in many ways. In streams which are not too deep, it is hunted, as it were, by torch light, and killed with spears. Great numbers are also caught in nets, and in traps placed at weirs for that purpose.

The poulterer deals in all kinds of tame

or wild fowl. He generally obtains his geese, ducks, chickens, and turkeys, from farmers in the country. His wild fowls, such as teal, widgeon, snipes, and mallards, are obtained from the wilder districts of the country, or from the north of Europe. Game, such as hares, pheasants, partridges, woodcocks &c., are brought from the country. Gentlemen now sell their game, instead of giving it away as they formerly used to do—to show their love of the principles of free trade.

THE TAILOR.

THE TAILOR.

THE tailor is a very useful but a very troublesome man. He is very unpunctual, and he is often very much given to over-charging. He is pleasantly called the knight of the thimble; at other times, the knight of the order of the goose. His business is to make clothes for men.

The tools of the tailor are a measure, scissors, shears, needle, thimble, bodkin, goose, and his board upon which he sits, cross-legged like a Turk.

The measure is a line or tape, or piece of

parchment, marked in inches and parts; with this he measures the person whose clothes he has to make. He takes the girth of the body and waist, the length and breadth of the back, the length and girth of the arms, and the length of the chest. When measuring for lower garments he takes the breadth of the lower part of the waist, the length from the waist or hip to the shoe, the girth of the knee, &c.

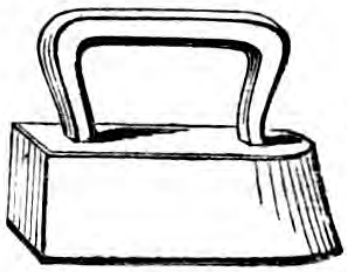
When he has taken the measure the tailor goes home to cut out the garments: sometimes he cuts a pattern of the coat, waistcoat, or trowsers to be made, on brown paper, which he lays over the cloth, and then cuts the cloth to its shape: at other times he chalks the dimensions and shape upon the cloth, and then cuts out the

garment from these chalkings, and according to the pattern in fashion. This is the most difficult part of the tailor's business, and requires some talent and an eye for form. Most of them make a shocking bungle in their attempts to make clothes fit, and give them, instead of the neat and compact appearance which clothes ought to have, the clumsiest air imaginable. Country tailors are most vile fitters.

Most people know what a needle is, and with it the tailor sews his seams; but there is now coming into use a sewing machine, which will sew the seams of a pair of trowsers in a few minutes, and make a coat in a very short time. It is a most ingenious instrument, and works with such rapidity as to be quite astonishing. The large London out-

fitting houses are beginning to use this machine, and it is to be hoped that it will soon diminish the number of tailors, for tailoring is not a fit occupation for men.

The tailor's goose is a heavy piece of thick iron, smooth beneath, and having a handle above. With this the tailor presses down the seams after he has sewn the cloth together. It is generally made hot before he does this. He presses it on a board, which he can put into the sleeves of coats, or legs of trowsers, and thus his work is made to look neat and compact.



In the large tailoring establishments of London, where cheap clothes are sold, a most cruel system is carried on, called the "sweating system." Connected with these

immense clothes marts are certain people who employ great numbers of hands, in the most wretched parts of London. In large, ill ventilated lofts or cellars, hundreds of miserable tailors, almost in a state of nudity, work from sixteen to twenty hours a day, upon the most sorry pittance. They are half starved, and disease frequently sets in among them, carrying off scores at a time. Here coats are made at sixpence each, and the better kinds seldom pay more than four shillings. It is rare that any of these unfortunate creatures earn more than six or seven shillings weekly. They are in fact far worse off than the black slaves in America or West Indies, that so much fuss is made about. It would be well, before we lament the wickedness of man towards man in

foreign countries, that we should know a little of what is passing in our own, and then we might have a little sympathy for the sweating tailor.

THE HATTER.

THE hatter is a very useful man; and his business is a very arduous one. Of late years hats have no longer been made of the fur of the beaver, as they once were, but of silk; and a hat which used to cost from twenty-five to thirty shillings, may now be had to look quite as well, and to last almost as long, for eight or ten shillings.

In the old hat-making process wool and

THE HATTER.

hair of various kinds were used, such as the furs of hares, rabbits, moles and beavers, as well as the hair of camels and of goats, but now silk and cotton are all but universally employed.

Hats are said to have been introduced about the year 1400, which then took the place of chaperoons made of black cloth, and hoods made of various materials. In former times the finest and most valuable hats were made from the fur of the beaver, as most capable of resisting wet; but in process of time the body of the hat was made of various kinds of wool, and the beaver fur was put on the outside only, and at last beaver hats had not a morsel of the fur of that animal, either within or without, and were composed entirely of rabbit-hair or cat-skins.

The principal thing in a hat is the body. This, in the hats called beaver hats, if there be any such things now-a-days, was performed in the following manner. First, the materials above described were washed, carded, and cut into proper lengths. The fibres of these materials were then well separated from each other, by an operation called bowing; consisting of a bow, the string of which being suddenly let go with uniform quickness over the stuff, scatters and loosens it. This was then gathered and worked by the hand into a somewhat oval figure, called a batt, which is designedly made thicker in the brim near the crown, and towards the circumference.

The "batts" thus finished, they are felted into closer and more consistent flakes, by

pressing them down with a hardening skin or leather. This done, they are carried to the basin, which is a sort of bench with an iron plate fitted therein, having a small fire underneath it, upon which laying one or two of the hardened "batts" sprinkled with water, the heat of the fire, with the water and pressing, embody the wool into a light hairy stuff or felt, after which, turning up the edges all round, it is laid by, and the workman proceeds to the manipulation of another. This finished, the two are now pressed together so as to meet at an angle at the top, and thus form one conical cap.

The hat being thus "basined," as it is called, is removed to a large kind of receiver or trough, resembling a mill hopper, sloping or narrowing from the edge or brim to the

bottom, which is a kettle filled with water or grounds of beer, or water rendered sour by vitriolic acid, and kept hot for the purpose. Upon the sloping side, the *basined* hat being first dipped in the kettle, is laid, and is again *worked* by rolling and unrolling, turning and twisting about, till at last it is reduced to the size required.

The hat, after being thus wrought, has to receive its determinate shape: for this purpose it is laid on a wooden block of the intended size of the crown of the hat, and beat in by means of a tool called a stamper, till it has reached the bottom of the block, and the crown is formed. It is then taken out and set to dry. It is afterwards singed to remove superfluous hairs, and then carded with a fine card to raise the nap. After

this it is again placed upon its block, and dyed by being boiled in the colouring liquor, in a kind of copper called the dyer's vat. It is then taken out and dried in a stove. When dry it is stiffened by a solution of glue or gum. It is next steamed on the steaming basin, and when moderately hot the workman strikes gently on the brim with the flat of his hand, to make the jointings incorporate and bind, turning it from time to time, and at last setting it on the crown. When sufficiently heated and dried they put it again on the block, and brush and iron it on a table or bench called the stall-board. This is performed with irons adapted to the purpose, and with these and the use of a brush, the hat is gradually brought to the state in which we see it.

The silk hats now so common are made in a much more simple manner; the bodies of these kind of hats are made of thin material, of straw, willow, or other wood: this is smeared over with a water-proof varnish, and then a silk material, prepared by the manufacturer, cut into pieces of the required shape and size, is laid on, and nicely united at the rim and edges, and thus we have the "silk hat;" the very best of which, and at a very moderate price, may be had of Holbrook, West Strand, where the author has had them for years.

THE SHOEMAKER.

THE SHOE-MAKER.

THERE are various articles made from the skins of beasts; among the most common, and of course the most useful, are boots and shoes. But before the shoe-maker can make "skins" into boots and shoes, the skins must be converted into leather. Hence we observe how one trade depends upon another, and how one man depends upon another; so that we ought to feel no contempt for any one, seeing that all are bound together by the ties of interest.

Before the skins of beasts can be made

into leather they must undergo a process of the tanner, called tanning. There is in the barks of various trees, particularly of the oak and elm, a vegetable principle called "tannin:" this is the great antidote to putrefaction, and when this principle is united to the animal matter, gelatine, which is the moist constituent of skins, a substance is produced which is insoluble in water, resists putrefaction, and on drying becomes hard and tough. This substance is leather.

The usual method of preparing skins for leather is first to put them into pits containing lime and water, where they are left to soak for a certain time; after this the hair and fleshy parts of the skin can be easily scraped off. After this the hides or skins are put into pits, filled with the ground bark

of the oak, elm, or larch tree, saturated with water. Here they remain for a considerable period, say for several weeks, according to circumstances. The hides are then removed from the pits and allowed to drain, and then, being stretched on a wooden beam, are beaten with a heavy smooth pin, in order that they may be rendered quite smooth.

After this the leather so made has to be submitted to another process, viz.; polishing and graining. Being stretched tightly upon a smooth inclined board, the skin is smeared over with a little oil, and then polished by means of a glass ball held in the hand. The graining is produced by rubbing it strongly with a ball of box-wood, round the centre of which small parallel grooves are cut. The currier finishes the process still further,

and the leather is by him stained blue, black, red, or other colours, as may be required.

The leather being thus prepared it is the business of the "*shoe-maker*" to make it into boots, shoes, slippers, &c. Boots and shoes are made by the same persons, but the boot and shoe-makers, in their corporate capacity, are called *cordwainers*.

The most delicate part of the shoe-maker's business is the "cutting out department," called "clicking," i.e., to cut out from a skin the "uppers" or the "soles" of the boots and shoes: some men will do this very expertly, and so lay out the leather as to cut it to the very best advantage. A very clever clicker has been known to earn two guineas a-day.

The uppers and soles having been cut by the clicker, they are usually sold to the shoe-makers by the leather sellers, all ready to be made into shoes. The "uppers" and the "soles" are of various prices, according to the goodness of the leather; and great roguery is practised by unprincipled shoe-makers in making boots and shoes of the inferior priced materials, and charging you the highest prices. Every one ought in a degree to be a judge of what he buys, and not suffer himself to be imposed upon. Therefore, my young friends, look well to your boots and shoes.

The shoe-maker uses a block of wood, something of the shape of the human foot, called a last. Upon the bottom of this is fixed, by means of small wooden pegs or iron

tacks, the leather which is to form the sole. The upper leather, or body of the shoe, usually consists of three parts, one before and one at each side, united at the heel. These parts are first sewed together. The upper leather is then sewed to the sole. He does not use a needle, but in its stead a sharp-pointed bent piece of steel, called an awl. With this the shoe-maker makes a slanting hole through the sole and the upper leather, and then, by means of a bristle at its end, passes a waxed thread through it, by which he unites the two. The thread is formed of flax, and well waxed with a compound of grease, pitch, and rosin, called cobblers' wax.

When the sole is sewed on, the shoe or boot has some small pieces of thin leather

pasted on the bottom on the inside, and round the inner part of the heel, to make it look smart, and is then finished by being nicely blacked and polished up.

THE BRICKLAYER.

ONE of the most useful of all the trades is that of the bricklayer. The bricklayer builds the walls of houses and other buildings, and he uses various tools in his work.

The first of these tools is the trowel. It is a thin, flat, lozen-shaped blade of steel, fixed into a handle. It is with the trowel that the bricklayer works up and spreads the mortar.

Mortar is made with newly burnt quick lime, and of clean river sand. The lime is slacked by pouring water upon it, and when it falls to powder the sand is added, and both are mixed up together into a thick mass, fit for being spread on and between the bricks by the trowel. The use of the mortar is to stick the bricks together. When it gets dry it adheres to the bricks, and, after a time, gets as hard as the bricks themselves.

The mortar is usually made by the bricklayer's assistant, called a labourer, who is generally an Irishman. He mixes the water and the lime and the sand together, by means of a shovel. He then takes two or three shovelfuls and puts them into a three-sided box, called a hod. This has a long handle to it. He then puts the hod on his shoulder

and carries the mortar to the bricklayer, and throws it down upon a board, from which the bricklayer takes it with his trowel.

Sometimes poor "Paddy" has to travel with his hod of mortar or of bricks—for bricks are also carried in a hod to the bricklayer—up very tall ladders to the top of the wall or building. In very high houses he has to go from one ladder to the other, and across dangerous rafters, before he can get to the spot at which the bricklayer works; but Paddy never complains, but goes along from ladder to ladder singing and merry.

When the bricklayer lays a brick, he first takes up a large lump of mortar with his trowel; this he spreads on the foundation, a little hollow in the middle, then he lays the brick gently into this bed of mortar, gives it

a slight tap with the end of his trowel, and looks to see if it be quite level and even; he then scrapes from its sides all the loose mortar, and settles the brick nicely in its place. He then takes the next brick, which he serves in the same way.

The manner in which the bricks are arranged in any piece of work is termed *bond*, and this is of different kinds, according to the thickness of the walls, and the purpose for which it is intended. The bond most generally used is termed the Flemish, in which the bricks are laid alternately, length ways and across the thickness of the wall; the broadest side of the brick being laid horizontal, and never edgeways in building walls of any thickness.

But the workman cannot lay his bricks

without some other tools than those I have mentioned. There are the square and the level. They are made of wooden rules put together. The first is a true right angle, to enable the bricklayer to set out his walls correctly, perpendicularly to each other: the second is framed like a ⊥, with a plummet hanging on a slit in the upright piece; now, as the two rules are correctly perpendicular to each other, it is clear that when the first is set, by means of the plumb line, perpendicularly to the horizon, the other will be truly horizontal. By means of these instruments, therefore, the bricklayer guides his work, so that the wall he is building shall be upright, and the courses of bricks composing it horizontal.

The bricklayer also makes use of a string

stretched between two pins, to enable him to keep his work straight, and he lays the outermost bricks, those forming the face of the wall, carefully by this guide. As he proceeds he frequently makes use of his level and square: by the former he examines whether the face of his wall and all the corners are correctly perpendicular, and whether the courses of bricks are laid quite horizontally.

Brickwork is measured by rods, which is a superficial area of sixteen feet and a half each side, or 272 square feet at a thickness of one and a half brick. A rod of brick-work contains 4500 bricks, and, together with the mortar required to build it, weighs about 15 tons 8 cwt. It differs in value from 10*l*. to 15*l*. per rod.

THE UPHOLSTERER.

THE upholsterer very frequently combines the cabinet-maker, paper-hanger, and decorator. He frequently furnishes houses entirely, and fits them up for the convenience and comfort of those who dwell in them. Tables, sofas, chairs, beds, looking-glasses, and such things, come under his department; and besides the common kinds of wood he uses the more expensive kinds, such as "satin wood," "cypress," "rose wood," "cedar," &c. He also makes great use of the art of veneering, which is a process by which the

common kinds of wood are overlaid with thin strips of the finer kinds, by which means articles of great durability and beauty can be produced at a comparatively cheap rate.

Sometimes the upholsterer undertakes the papering of a house. There are many descriptions of paper of an almost infinite variety of patterns. The most expensive kinds are ornamented with gold, on the finest flock or satin grounds, and are worth from ten shillings to a guinea a yard; the commoner kinds vary greatly in price, some being as low as a farthing a yard. I may as well say a few words about the methods by which the paper used for covering the walls of rooms is made. The paper is made in long strips of about twelve yards long, called *pieces*. These are placed upon a roller, and

hung on a frame above the workman, while, as the roller turns, each successive portion is brought over a set of blocks of the patterns of which the paper is to be; upon these the paper is pressed, carried forward, laid on and pressed again, till the whole piece has been through the process. If only one colour is necessary to be on the paper, the paper is then finished; but if the paper is of various colours, blocks are prepared to carry each colour by itself, which is printed in the whole space of the pattern where the other colours did not touch, by a similar process to the first, and so on through any number of patterns or of colours that may be required.

The paper, when about to be hung on the walls, is cut into strips, the length that the

room is high, and so cut that the patterns will match on either side. The lengths or strips are then pasted with a large brush and good paste, and laid even upon the wall; the workman smooths them down with a large dry brush as he proceeds. Sometimes, instead of the paper being hung on the walls, the walls are prepared by battening, that is, they are covered with canvass projected from them by means of a slight frame-work of wood passed round their borders. Of late years, rooms are fitted up in most beautiful style by the patent papers, and present the finest specimens of taste and elegance imaginable.

An upholsterer ought to be a person of taste and knowledge, as was Mr. Noyce, the most celebrated among such persons in his

day, which is a long time ago—the days of George III. and the Prince Regent. This gentleman did much to improve the taste of successors in the art; and we may say, that not even the French can surpass us in the elegance of our designs, or in the exquisite taste displayed in carrying them into execution, among the higher classes.

The middle class of people still display but little taste in their dwellings. They crowd their rooms with expensive, heavy, disagreeable-looking furniture, of all sorts and sizes and of every pattern. These draperies exclude the light, and multiplications of gaudy finery and knick-knackeries are in such excess, that you are afraid to turn in their cramped apartments. It is rare indeed that you behold anything

of true elegance among them. But we may hope that, in due time, simplicity and elegance will find its way even among this class, and that the happy homes of England will be among the best furnished, and decorated by intelligent and tasteful upholsterers.

THE PAINTER.

CLEANLINESS and niceness in appearance is very different in the various districts of England. Some counties are proverbially dirty, and others as remarkable for cleanliness. In some places, the houses are nicely painted every year; and, in others, the

THE PAINTER.

landlord or tenants think it well if their houses are painted once in seven years. Now there is nothing so creditable to persons as to keep their houses clean and nicely painted; and therefore we give a chapter on house-painting.

Besides the advantage of cleanliness, the practice of house-painting tends greatly to preserve the parts so painted. The wooden parts of buildings are subject to decay, and the iron parts to rust, particularly if exposed to the weather; and even stone crumbles away by the action of the wind and rain.

To remedy these inconveniences the art of painting comes into play, and oil mixed with certain substances of various colours, as well as with certain chemical compounds,

form a menstruum or medium which, spread over wood, stone, iron, or other substances, completely shelters them from the action of the wind and water; while, at the same time, it adds much of beauty to our buildings and dwellings.

The house-painter uses few tools. These consist of a knife with a broad flexible blade, blunt on both sides, various brushes, pots for his paints, a grinding-stone to work the finer kinds of paints upon, and a tool called a grainer; with these simple implements he proceeds with his work, and when he chooses can get over a great deal of space in a day.

The principal paints are red and white lead, yellow and brown ochre; Prussian indigo and other blues; lake, carmine,

Spanish brown, raw and burnt Sienna earth. These, being ground in oil, are further diluted with it, and, mixed with a proportion of spirits of turpentine, to accelerate their drying, are put into pots and are ready for use.

When the painter begins to paint a house, he first goes over the old paint work with a cleansing brush, and makes use of pumice-stone to rub down all the rough projections or peelings of the old paint work. He also stops up with putty all cracks and holes, and, if any little matters are loose and shaky, he puts a tack in to make the surface over which he has to work clear and free to the brush. If the place to be painted be new wood or other material, he *primes* it or paints it with a thin coating of lead colour.

If it has been painted before, he puts on a thin coating of the same colour. When this is thoroughly dry he puts on another coating of paint, and sometimes a third, and then the painting may be called completed.

In England, houses are generally painted white or stone colour, and the doors grained to look like oak or mahogany, while the interiors are decorated with light and delicate colours. But in some countries, such as Holland, the houses are sometimes painted with the most gaudy colours—red, blue, or yellow—and occasionally with all these and other colours combined, which have a very singular appearance.

In our own country, we are famous for our signs, and used to be more so than we

are now. A hundred and fifty years ago, almost every shop had its sign. Now signs are principally confined to public houses; and we have the portraits of the "Queen," the "Prince," "Wellington," "Sir Charles Napier," and "Omer Pasha," in every street. A sign-board is usually painted black; the portrait in strong bright colours, not very much like the original, and with golden letters. Among the odd signs are the "Goat and Compasses," "The Good Woman" (that is, a woman with her head cut off), "The Dog and Porridge Pot," "Tumble-down Dick," and others.

Painters are subject to some painful diseases—such as palsy (called the painters' palsy), and colic (called the painters' colic)—which might be avoided to a great extent

by cleanliness on the part of the workers in paint, and by using other precautions; the diseases of the painter are principally caused by the paints made from a preparation of lead. They should, therefore, be very cautious in the use of these kinds of paint.

THE SMITH.

THE SMITH.

THERE are several kinds of smiths—the blacksmith, the locksmith, and the coppersmith. The blacksmith does the heavier kinds of work, and makes horseshoes, chains, iron railings, tires for wheels, hoops for casks, ploughshares, iron teeth for harrows, and such things.

The locksmith makes locks and bolts, hangs bells in houses, and works lighter articles in brass or tin, as well as in iron. He makes or sells iron and tin saucepans, fryingpans, candlesticks, kettles, pots,

and dishes. He is often united with the tinman.

The coppersmith makes coppers, copper boilers, saucepans, skillets, copper sheathing for ships, copper fastenings for boats, and copper plates upon which pictures are engraved. He is often united with the brazier.

The tools of the smith are a forge, large bellows, an anvil, a beetle, sledge-hammers, small hammers, gouges, punches, dies, chisels, nippers, pincers, and pliers. He has a trough full of water close by the forge, to cool the hot iron with. When the blacksmith goes to work, he pulls off his coat, puts on a loose leathern apron, and tucks up his shirt-sleeves to the arm-pits. He then takes hold of a piece of iron with his nippers and puts it in the fire. A boy

behind the forge then blows the bellows with all his might. The fire burns fiercely, and the iron gets red hot.

When the iron is quite red and sparkling, or sometimes at a white heat, the blacksmith takes it out and holds it on the anvil. If it be a large piece of iron, two other smiths come, and with large hammers beat it as hard as they can into the proper shape. The reason why the iron is made so hot is because when hot, it is very soft and can easily be worked.

When the iron has been beaten into the shape required, the smith dips it into the trough to cool it. Then he looks at it and measures it by his gauge or rule. If it be not the proper size, he puts it into the fire again, beats it a second time, and shapes it

with a small hammer till it is of the right form.

The smith is a very useful man. Without the smith, our houses could not be built; coaches or ships could not be made; strong tools, such as pickaxes, spades, and hatchets, could not be formed, nor railroads laid down.

The metals used by the smith are iron, copper, tin, and steel. Iron is the most useful of all metals. It is found in great masses sometimes, and in the state of ore it exists in every part of the world. It pervades almost everything, and is the chief cause of the colour of various earths and stones. It exists also in plants, and in the blood of men and animals.

Copper is found, in veins and in beds, among granite, slate, and limestone and

other rocks, and also in masses. It is used for covering the bottom of ships, for sauce-pans, and for plates called copperplates on which pictures are engraved.

Tin is found in a stone of a brown colour called tin-stone. It is used for a great variety of purposes. Steel is iron hardened and tempered by being heated with powdered charcoal, and then suddenly cooled by plunging it in cold water.

The usual division of the work of the smith, is that called whitesmithing and blacksmithing. The whitesmith gives his work a fine clear polish, such as we see in fire-irons and several other articles. The black-smith leaves his work in the natural dark grey colour of the metal.

THE CARPENTER.

THE carpenter is one of the most useful of men, and he does a great deal of work of various kinds in the building of a house or ship. There are two kinds of carpenters—the house-carpenter and the ship-carpenter; of the ship-carpenter I shall speak in a future chapter.

The carpenter uses a great many tools, and most of them are expensive. His principal tools are the *long saw*, to cut planks out of large trees. The *small saw*, to cut the wood into smaller pieces. The *plane*, to make

THE CARPENTER.

the wood smooth. The *pincers* and *nippers*, to draw out nails. The *gimlet* and *auger*, to bore holes with. The *hammer*, to drive nails with. The *adze*, to cut off knots and bark from large pieces of wood. The *chisel*, to cut out square holes with. The *mallet*, which is used like a hammer with the chisel. The *screw-driver*, to drive screws with.

Besides these tools the carpenter uses other instruments. First, the *square*, which is used by him to ascertain if his angles or corners of his work are correct. Next, the *plumb-rule*, which is used for a similar purpose. Besides these he has various rules, compasses, gauges, levels, and other instruments.

The carpenter and joiner does a great deal of work in the building of a house. He makes the doors and window-frames, lays

down the floors and frames the roof. In these operations he works at his bench, and gets all the several parts of the doors, windows, or roof ready before he puts them together. In this work, his principal skill is seen in making joints, and in putting the pieces of wood nicely together. This is often done by a process called dovetailing, by which a projecting part of one piece of wood is fitted exactly into a cavity formed in the other. If he wishes to connect one piece of timber with another, so that they may form

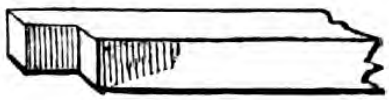


Fig. 1.

one right angle with an equal degree of strength in each piece, then each is notched half through, or as it is termed, half cheeked. The two are then nailed or pinned together. In Figure 1 are represented the cheek of one piece

ready to receive the neck in a similar cheek in another; and in Figure 2 are the two pieces joined together by this socket joint. In the same way he proceeds when he wishes to join two beams of wood at other angles than that of a right angle—only that he gives the notch or cut in a slanting direction.

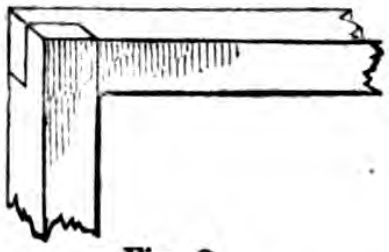
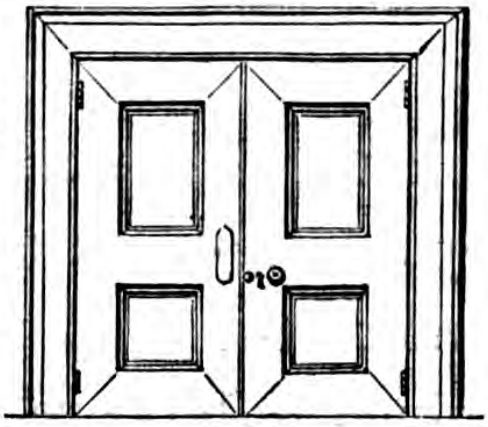


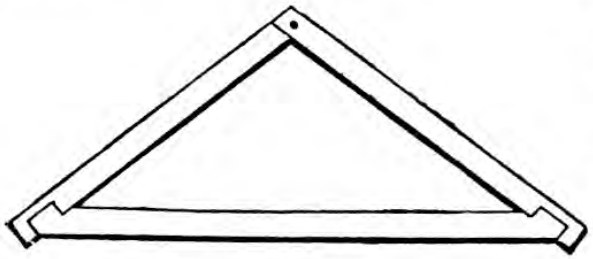
Fig. 2.

The utility of joints of this kind is very great in all kinds of roofing, framing, sash-work, and door-work, as well as in floor-work. Doors and windows are of various forms, according to the taste of the builder. Doors are single, opening upon one pair of hinges, or double, being in



fact two doors meeting each other in the middle of the doorway. Floors are formed by deals laid across beams called joists, which stretch from one wall to another.

In the construction of roofs much art is displayed. Two strong beams are notched into each other at the necessary angle, which is varied according to the width of the house and height of the intended roof. The opposite end of the rafters, as the beams are called, rest upon the walls, and about midway their union is generally strengthened by a cross-beam cheeked into each. This is one of the simplest forms of couples, as the joined rafters are named.



I have mentioned that large trees were

sawed into planks by the large saw of the carpenter. Timber-sawing is however performed by persons called sawyers. The tree to be sawn is laid upon a plank of wood at the top of a pit about seven feet deep, called a sawpit. One man, called the top sawyer, stands at the top and guides the saw, the other stands at the bottom o the pit and pulls it with all his might, and by the up and down motion of the saw, the tree is cut into planks of various lengths. Most of the large kind of sawing is now done by steam, and the machinery of a circular saw, which moves with great velocity, and does as much work in a day as two men would in a month—such is the power of machinery.

THE SHIP-CARPENTER.

THE ship-carpenter is a very useful artisan, for without him we should have no ships, and then England would be no longer a great nation.

The ship-carpenter must be a man of strength and skill, for there is both strength and skill required in building a ship. When a ship is to be built, a great deal is to be done. The first thing is the laying down of what are called the stocks or framework, on which the ship is to be built.

The stocks are formed of massive pieces

of wood, and are higher at one end than at the other, forming what is called an inclined plane, which is carried out towards the water, so that the tide when it rises will come over it.

When the stocks are prepared, the next thing is to lay down the keel, which is supported on blocks of wood placed across between the slide or ways. On the top of the keel branch out on each side long bent square timbers called ribs. Upon these timbers, where they cross the keel, is laid in the same direction as the keel another long square timber called the keelson.

To the ribs the planks are nailed and bolted through them, after which the seams are caulked by forcing oakum, steeped in tar or pitch, into the space between the planks.

The part of the ship which is under water, is covered with thin sheets of copper.

Beams, called transoms, are now placed across the ribs from side to side, and there are pillars called stanchions run up through the middle of the ship, which form a centre support for the transoms. On the transoms the flooring of the deck is laid.

The long narrow timbers, which are nailed lengthways so as to hold all the ribs firmly together, are called ribbands. These have a fine sweep according to the width of the vessel. When the ship's hull is completed she is ready to be launched.

The ship being supported in an upright position on the stocks or ways by strong pieces of timber framed together, called the cradle, she is prevented from sliding

down the stocks until entirely ready, by strong timbers called shores, placed in a slanting direction, with one end firmly planted in the ground and the other resting against the hull of the ship.

When every thing is ready for the launch the ways are greased to prevent friction, the shores are knocked away, and by her own weight the ship glides majestically into her native element, to be employed in commerce or to fight the battles of our country.

The earliest ship of which we read is Noah's Ark, if that can be called a ship. It is thought that the first ships or boats were merely the trunks of trees hollowed out, such as we see in the canoes of the South Seas. About four thousand years ago we have accounts of ships, and the Greeks

and Romans had them of a considerable size.

The Roman and Greek ships were very handsome. The prow was painted and gilt, and had figures on it representing the form of the gods. Its sides were called cheeks. The part we call the stern they called the goose, from the image of that animal, placed there as an omen that the vessel should never sink. The banner stood at the bow, and was usually a tree, flower, or some other emblem. The stern was often carved into the form of a shield. At the stern stood also the tutela or chosen ship-god, to whom prayers were daily said and offerings made.

The ships that bring goods to us from other countries are called merchantmen.

Those that are used for fighting are men-of-war. The largest of these carry as many as 150 guns.

There are many kinds of ships; some have only one mast, some two, others have three, and some have four. A sloop is a vessel with one mast, having a top-sail made square. A cutter has one mast also, but she has no square top-sail. A schooner is a two-masted vessel with fore and aft sails like a sloop, having a boom to each mast. A brig is a square-rigged vessel with two masts. A smack is a small vessel. A steamer is a ship made to move by the power of steam, and is variously rigged.

The largest ship in the world is now building; she is to be 680 feet by 83 feet wide, and 56 deep. Her steam engines are

to be of the power of 2600 horses, and she will have 500 separate cabins for passengers of the first class, and as many of the second class; and she will make a run to India in about a month.

THE ROPEMAKER.

ROPE-MAKING.

THE hemp of which all our ropes and the greatest number of our varieties of string are made, has up to the present time been brought mostly from Russia; but it is to be hoped that our Suffolk and Norfolk farmers will endeavour now to cultivate both hemp and flax for themselves.

The hemp sent from Russia comes over in great bundles weighing from forty-five to sixty-five "*poods*" each, the pood being a Russian weight equal to about thirty-six pounds avoirdupois. These great bundles

are made up of smaller bundles called "heads," each weighing about twelve pounds, and these heads pass into the hands of the rope-maker.

The first process the hemp undergoes is that of hackling, which is effected by drawing the fibres over pronged instruments called hackles, which clear from them the refuse, and split them into different degrees of fineness to suit the purpose for which they are required. The hackles are of different degrees of fineness, and the hemp is drawn over first one hackle and then the other, till the proper degree of fineness has been obtained.

The hackled hemp being laid by in bundles, the spinner next operates upon it and produces threads or yarns. This is

effected by a *rope-walk*, a covered shed from six to twelve hundred feet in length, at both ends of which are machines for communicating twist to the yarns, and along both sides of which at equal intervals and opposite to each other are upright posts. Between every pair of posts a rail stretches across the walk, at a height of eight feet from the ground, and, along the under side of the rail, hooks are fixed for supporting the yarns, and to one of the upright posts of each pair is fastened a large hook on which the yarns are hung when collected together.

At the head and foot of the walk are stout posts also, for supporting the yarns. The spinning machinery consists of a wheel turned by a winch, and having a band working round half its circumference and half

round an arc, in which are fitted a number of little pulleys or hooked wires, by which arrangement twelve or sixteen of these little hooked wires are set in rapid rotation, each on its respective axis.

The spinner takes a bundle of hemp and passes it round his waist, the middle or doubled part being in front and the ends passing each other at his back. He then draws out from the face of the bundle as many fibres as will make the size of yarn required, the middle or "bight" of which he hangs on one of the whirl-hooks. He grasps the fibres between the fingers and thumb of the right hand, with a piece of woollen cloth interposed for the protection of his hand. He now walks backward down the rope-walk, while an assistant

workman turns the wheel at the end, and thus, by making the whirl-hook rotate, imparts a twist to the fibres attached thereto.

In this manner the spinner proceeds until he comes to the end of the walk; or as many men may be at work at once, as there are whirl-hooks rotated by the spinning wheel. As each man arrives at one of the cross rails, he throws his yarn up on one of the hooks, by which the yarn is prevented from dragging on the ground. The men then join the ends of every pair of yarns, and hang them on the hooks inserted in the side posts, each pair being kept separate. In order now not to waste the time necessary in going from end to end of the walks ineffectively, the men proceed to spin a second

set of yarns from the wheel at the bottom or foot of the walk, at which they have now arrived. Thus the spinners continue until they have collected about four hundred yarns, which are slightly twisted to keep them together, and are then coiled up. About six thousand yards of yarn are produced from a bundle of hemp weighing sixty-four pounds.

The process which follows the spinning of the yarns, is that of *tarring*. The tar is put into a copper, called the tar-kettle, and the yarn is dragged slowly through it, by means of a capstan, and is then coiled up on a stage or frame, placed at hand for that purpose.

The next operation is that of making or laying the "strands," which is done in the

laying wharf. The proper number of yarns to make a rope, are separated and properly arranged, and having been all stretched tight by means of a sledge provided with pins, &c., are then twisted so as to form what is called the "*strand*," which is, properly speaking, the third part of a rope. The three strands are formed into a rope by an apparatus moved by men, which twists them in the direction of the twist, so that the whole are firmly and uniformly bound together by the fibres strongly compressing each other, which makes the rope hard and compact, and enables it to resist the penetration of water; and thus we have what is called a *great rope or cable*, as you see in the picture.

THE SAILOR.

As we could not do without ships, so we could by no means do without sailors. For sailors not only defend our country in time of war, but also assist in bringing the produce of one country to another, and by this means supply many of our most important wants, both in time of war and of peace.

To be a good sailor, a man should be trained early to the profession. Boys who have begun life at sea in coasting vessels or fishing smacks make the best sailors.

THE SAILOR.

Here they learn to rough it—to go aloft, to manage a boat, to pull and hawl, belay, and eat hard biscuit, and to stand salt water and heavy gales of wind. Such boys, when transferred to larger ships, and well treated, soon become expert sailors.

The principal things on board of a ship, which a young sailor has to make himself acquainted with, are the compass, the lead and line, the anchor, flags, cables, the windlass and capstan, the rudder, the quadrant, sextant, &c.

The principal thing is the compass; and the first thing the young sailor has to learn, is to box it, that is, to repeat it backwards and forwards, in its several points, as North—North and by east—North-north-east—North-east and by north—North-

east; and so on through the two-and-thirty points.

The compass itself consists of a box, within which there is a round piece of card with lines drawn upon it. These lines are marked as you see them, N. for north, N.B.E. north and by east. N.N.E. north, north-east, and so on.

Over this round piece of card, so divided into points, called points of the compass, and which is called the *card*, is a little piece of steel called the *needle*. This needle has been rubbed with a piece of magnetic ore called loadstone, by which it has acquired the curious property of one end always pointing towards the north, and the other towards the south. On board ship, the card itself is made moveable, and is attached

to the needle, and is placed in a kind of box in a kind of little house called the binnacle, where the man who steers the ship can have a good view of it.

Anchors are made partly of wood, and partly of iron. The wooden part, with iron ties, is called the anchor-stock. The iron part between that and the bottom, is called the shank. The two arms are called the flukes. Cables are of hempen rope or iron. Those made of iron are called chain-cables. The use of the anchor and cable, is to hold the ship. When the anchor is cast into the sea, the flukes pierce the ground and stick fast in it, and the ship, pulling by the cable, forces the flukes deeper in, and thus she is held at her anchorage.

Buoys are of various shapes; some are

conical, some are of the form of a double cone joined together at the base. They are attached by a long line to the anchor, and are thrown overboard with it; rising up to the surface of the water by being light, they show the place where the anchor lies.

The windlass and capstan are both used for working the ropes. The windlass is a moveable reel, upon which the cable winds round. There are several square holes in it, into each of which the hand-spike is placed, and the windlass turned by the power of man. It is used for hoisting the anchor. The capstan is used horizontally, in the same way, for lading and unlading the ship.

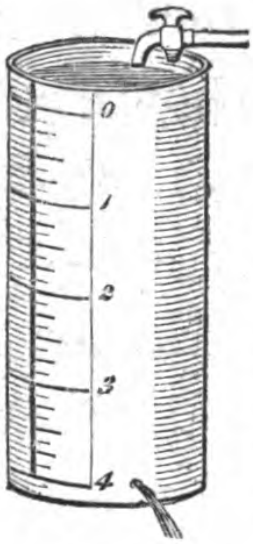
The vessel is steered by the rudder. The handle is, in the ship, called the helm, in a boat, the tiller. In larger vessels, a

wheel is put in place of the helm. When the helm is put to the right, it is called starboard; when to the left, it is called port; when in the centre, steady.

The quadrant is of great use in ships, as by its aid the mariner can find the right or meridian altitude, as it is termed, of the sun and stars. It is usually made of brass, or wooden bars faced with iron plates, having the edge nicely divided into degrees, minutes, and seconds, and it is furnished with two small telescopes and wheels, to direct the instrument to any object.

THE WATCHMAKER.

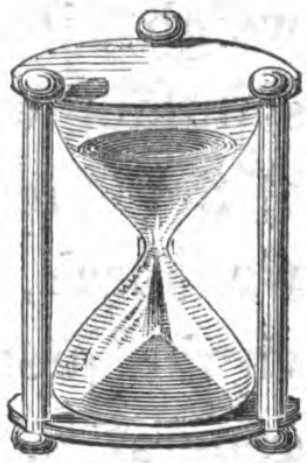
THE measurement of time has occupied the attention of mankind in all ages. The first mode was probably by means of the gnomon or sun-dial, whose shadow exhibited the



march of the sun from hour to hour. A very ancient method was by the water-clock. This instrument consisted of a vessel containing a certain quantity of water; on the sides of it, a scale was marked in hours and parts, and as the water oozed out from the bottom,

THE WATCHMAKER.

its surface lowered itself, and exhibited the lapse of time by the loss of water. The sand-glass is an improvement upon this, and the common hour-glass, which used to be, a hundred years ago, in almost every cottage in England, was used in a similar manner.



It is difficult to refer to the origin of watchmaking; but it is thought that watches were first made in Germany, about the year 1480. They were common in France about the year 1544, in which year the corporation of master clockmakers in Paris had a statute enacted, to insure to themselves the exclusive privilege of making clocks and watches. A watch, in the time of Queen Elizabeth, was a very curious affair. In point of size, it

closely resembled a common dessert plate of the present day; and with reference to weight, it was much better fitted for the shoulder of a market porter, than the side of the Queen of England. The one of which we speak, was really the property of this virgin queen. Watches did not come into general use till the time of King James I., and it was not till the reign of Charles II. that they were brought into reasonable dimensions.

The principal parts of a watch are the main-spring, the barrel, the escapement, the fuzee, the balance, and the dial. The moving power in watches originates in a steel spring called the main-spring. This is inclosed in the barrel, one end of it being fastened to the barrel and the other end to

the fuzee, which is a metal wheel in the form of a cone. When the watch is wound up, the chain which was upon the barrel is wound upon the fuzee, and by this means the spring contained within the barrel is stretched, for the interior end of the spring is fixed upon an immoveable axis about which the barrel revolves. The spring, owing to its elasticity, endeavours to recover its former position, which forces the barrel to turn round; this motion obliges the chain which is upon the fuzee to unfold and turn the fuzee. The motion of the fuzee is communicated to other wheels, until it reaches the hands, being regulated, as to quickness and slowness, by the balance and regulator. In clocks, the moving power is in the weights, and this power is regulated by the pendulum.

Watches and clocks are not made by the watch or clockmaker—the watch or clockmaker's business being simply to put the parts together. Different parts of each are made by different tradesmen. The wheels are made by one set of persons, the dial or face by another, the hands by a third, the case by a fourth, and the spring by a fifth, and so on. Most of these parts are made by machinery, in very great quantities, and with the most surprising accuracy. The watchmaker polishes and puts the several parts together, and his work is of very great nicety. He generally uses a magnifying glass, and often loses his eyesight, or gets it greatly impaired.

There is nothing more difficult than to get a good watch. The only way to do this,

is to pay a fair price for it, and to deal at a respectable watchmaker's, upon whose word and honesty you can depend. Millions of watches are manufactured not worth carrying, and which are nevertheless sold at high prices by a worthless set of tradesmen. Many go very well for a few weeks or months, and afterwards are not worth anything except for the silver or gold of the cases.

THE NEWSMAN.

ONE of the most important men of the present day is the newsman. It is to him that we are indebted for the distribution of the daily papers, which find their way, in an incredibly short time, to the remotest parts of the empire.

The newsmen, or newspaper agents, in the metropolis, are a very respectable body of persons, and some of them are of high standing and reputation. It is their business to supply the "trade" with the newspapers from the newspaper offices; and this they

THE NEWSMAN.

do by a system of such simplicity and regularity that all are duly served, both in the metropolis and in the country, with little or no complaint.

The newspaper boy is a very singular character; he whips about with extraordinary activity, with the papers under his arm, making up his sorts and flying about with them from place to place with the rapidity of lightning. It is a very exciting scene early of a morning, to see the newsmen and news boys clustering round the newspaper offices, like swarms of bees, to get their quota of the various journals. But upon the whole, they are a well ordered and well conducted race, and have too much business to do, to have any spare time for tricks or mischief.

The number of newspapers published in

England is large, and the circulation of some of them very great. The "Times" circulates daily, from forty to fifty thousand copies; the "Illustrated London News," as many as sixty thousand weekly; some of the lower priced papers, such as "Lloyd's Weekly Newspaper," circulate above a hundred thousand weekly.

Upon the whole, the newspaper press is a great credit to this country. Even the cheapest of the papers have a proper regard for good order and the best interests of the country. They are the safety-valves of the state, through which the combustible materials of society "blow off," and by this means prevent a "blow up."

THE BILL-STICKER.

THE bill-sticker is a very celebrated character. He is the great celebrator of those who would have celebrity. The good he did by pasting thirty thousand of "Do, Papa, buy Peter Parley's Annual for a Christmas-box," was immense.

Bill-sticking is both a science and an art. To learn it fully, a man must serve a very long apprenticeship. A good bill-sticker knows all the "blank walls," and all the "boarded ups," as well as all the "shored ups," sly corners and bold fronts

in the metropolis. Give him one thousand or five thousand bills over-night, and pay him well, and you will find yourself immortal when you wake in the morning. He does all this with a pot of paste, a brush, and a hanger, and with a perfection you can have no idea of.

The bill-stickers are now a fraternity, and your "posters" will not be covered by those belonging to it, for a reasonable time after posting; so that it is always necessary, before you employ a bill-sticker, to know whether he is of sufficient respectability to prevent your "announcement" being obliterated by a fresh bill pasted over it, the moment it is put up.

In all these matters, as is the case in most other matters of life, "Behave hand-

somely," "pay well," and "look sharp," are the rules which will carry us triumphantly through all our undertakings in any of the affairs of TRADE.

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