Machinery and Tools as they are.—Printing Presses.

(Continued from page 139.)

Hand Presses—The mighty printing machine counts its hourly productions by thousands, the humble hand-press produces at the utmost but a few hundred impressions in the same time; such being its vast inferiority, its total disuse would appear inevitable, and yet, contrary to this inference, the hand-press maintains its position, chiefly owing to its simplicity and consequent cheapness. As any kind of pressure is sufficient to obtain an impression on paper. a printing press might be an exceedingly simple machine, but it is made complex in order that the printing may be done well and rapidly. The first hand-presses were merely common screw-presses made of wood, and such, with slight improvements, they remained until within the last half century, when iron superseded wood in this machine, as it has in most others; nor was this the greatest change, for the screw was first improved by the addition of well-arranged bars, then totally abandoned, as not permitting sufficient rapidity, and its place supplied by compound levers. But without tracing its successive developements, let us content ourselves with examining the hand-press as it is now generally made. The frame is composed of a heavy mass of cast-iron, and consists of a stout head piece connected to an under piece nearly similar, by two strong columns. It will be easily understood that the whole of the pressure exerted has to be endured by these two cross-pieces of the frame, whence the necessity for their being made massive. On the under piece are placed the ribs, which form, as it were, a railroad, on which moves the bed destined to bear the type. Over the bed is suspended the platen which is intended, by being forced down, to press the paper against the type. This is effected by levers, having a fulcrum on the under side of the head piece, and bearing on the centre of the platen; the power of the pressman is further increased by the bar-handle, which is also a lever acting on those we have just mentioned, so that the whole arrangement forms a compound lever of great power, and which furnishes an exemplification of the law of virtual velocities. For the pressman grasping the bar-handle near its extremity, his hands describe an arc of a circle, whose diameter is considerable, whilst by this action the platen is made to descend through only a small space, but capable of overcoming a great resistance. When the impression is imparted, the next thing to be done is to raise the platen from the form, which is performed without occasioning any trouble to the pressman, for he simply relaxes the intensity of his grasp, when the platen is pulled up by spiral springs with considerable energy. The next duty of the pressman is to turn a crank, by which the bed (on which are lying the form and paper) is moved from under the platen, so that he can raise the blanket, the tympan frame, and the frisket. All which form the apparatus for securing the paper and preventing any injury to it from the type. Whilst he is occupied in detaching the printed sheet, and then fixing another to the tympan frame, the type receives a fresh supply of ink from a roller, impelled by means to which we will hereafter advert. The tympan frame is now folded down on the form and the bed made to resume its place under the platen, when the work of printing is resumed, all these several operations being performed 250 or 300 times per hour. In some hand-presses the bed is not movable but remains stationary, whilst the tympan frame alone is run out, and during its absence from its position on the bed, an inking roller is made to move over the form, which retires in time to allow the tympan frame to resume its original situation. For convenience, the press is placed upon standards to raise it to a sufficient height, so that the bar-handle which moves in a horizontal plane can be worked by the pressman, without the necessity of inclining the body. Such is a description of the machine more especially known as the hand-press, but a variety of presses that may be worked either by the hand or foot, are likewise manufactured. Probably the most ingenious of these latter are the card presses, now so much used by printers, they are intended for expedition, and as the form contains but a few pieces of type, a small bed and platen of about the size of the cards to be printed are placed vertically opposite to each other. The platen is stationary, and two small guides that are fixed to the upper part conduct the cards to their place on the platen, where they are held by a light spring. On the bed is fixed the form, and when the type is inked the bed is forced against the platen by a cam, it then runs back, when the card is released and drops into a box, whilst the printer who keeps the press at work by a treadle, can supply another card to the platen.

Not the least ingenious part of the mechanism is the inking apparatus which is self-acting, a fountain with the usual arrangement of rollers being placed above the bed and platen, when the bed has retired some distance from the latter, it stops, and an inking roller runs down, pressing against the type in its progress, and as quickly re-ascends. Nor is this the only form of the card press, many excellent machines of different shapes have been invented, some of the best kinds of which will be found described in the preceding volumes of the Scientific American. For example, in one kind the platen moves on a pivot, and is forced down by a roller on a vibrating angular piece, which latter also supplies an inking board; (see Sci. Am., Vol. 7, p. 316). In another (Gordon's Card Press) the form is attached to a revolving cylinder, and the paper or card-board, in an endless web fed down to a flat bed, and as the cards are printed they are cut off.

The supply of ink to the type is an important subject of consideration to the printer his predecessors used inking cushions or balls formed of sheep-skin, and stuffed with wool; yet later, a boy provided with a roller composed of a mixture of molasses and glue, supplied the form with ink after each impression, but it is now very common to have for this purpose a separate machine, termed an inker. There are various sorts of this apparatus, some of which are more simple but less convenient than others, but almost all employ a fountain or reservoir. In this fountain a roller is made to revolve, and as the ink, from its unctuous nature, is likely to collect in masses on the roller, a steel straight-edge is made to bear against it, and thus act as a scraper. Another roller that, in addition to its rotary movement, also vibrates lengthwise, receives the ink from the above, and finally, after these or further additional transfers, the ink is yielded to composition rollers, which are placed on carriages so as to be propelled over the form. It is in the mode of effecting this latter process that the inkers mostly differ, perhaps that which is worked by steam power is the neatest. In this case it is placed by the side of the press, so that the roller carriage easily runs on to the press bed. To operate it, the pressman, after raising the tympan, merely touches a handle, when the cog wheels which impel the carriage are thrown into gear, and, by a crank motion, turn a spindle, to which is attached one extremity of a long elbow joint. The other extremity is attached to the roller carriage, which, consequently, moves forward along the press bed, and afterwards returns, during which time the inking rollers bear against the type, the whole operation resembling the actions of a man who might hold a cylindrical body between his fingers and roll it back and forwards on a table. When the carriage has returned, the wheels are thrown out of gear, and then, although the distributing and other rollers are revolving and supplying the ink, the carriage is unable to move forward until the pressman desires.

On the use of gutta percha and papier mache stereotype cylinders, we will here make no comments, but wait until something practical has resulted; there is, however, a species of printing which has made advances equal to those already mentioned, and to which its processes are often very similar,—we allude to calico printing—all the cheaper cottons being now printed by a cylinder press. The pattern is engraved on the surface of a copper cylinder, which, by mechanism, is made to feed itself with color, take off what is superfluous, draw in the material to be printed, and then perform the printing. In this process several cylinders are employed (every color requiring a separate one), which are ranged around a large drum, each copper cylinder being supplied with its own trough of coloring matter and attendant rollers. To effect the printing, the cotton is passed between the large drum and the printing cylinders, which, in some recent presses of this description, amount in number to eight; an improved Calico press has been lately introduced by which each copper cylinder can be made to print in three or four colors by a novel arrangement;—this is the mode of printing ordinary articles, but those of a costlier kind are still printed by the block method.

For the Scientific American
Sulphur and the Cholera.

As it is highly probable that cholera will be prevalent this year, I deem it right to make a communication to you, for publication, of the very important fact that "sulphur infused through the system is a certain preventive of cholera. The best mode of administering the sulphur, and one which all classes and ages can employ, is thus:—For an adult put half a teaspoonful of washed flour of sulphur in each stocking every morning, so that the sulphur shall come in contact with the soles of the feet; the body has so great an affinity for sulphur, that it will be absorbed by the feet and become infused through the body, and effectually prevent an attack of cholera.

The above mode of administering the sulphur is the best, because it is susceptible of universal employment. Drinking sulphur-water and the inhalation of air slightly charged with sulphurous vapor is another preventive mode of administering the sulphur, which renders sulphur springs safe places of resort in the cholera season.

I annex an account of the mitigation of the cholera after the occurrence of an earthquake, and there is no doubt in my mind that it is due to the sulphurous vapor that escapes from the earth at such a time.

A St. Jago paper, speaking of the recent earthquake at that place, says it has effected prodigies, the number of deaths from cholera having diminished very materially, and the people generally believed that the earthquake had effectually killed the malady. Persons suffering under violent attacks arose from their beds, and after being for hours in the streets, in the damp morning air, felt no return of their sickness.

Firing cannon, or burning gunpowder, to a limited extent, would have a similar effect from the sulphurous vapor involved. This information as to the utility of sulphur in the prevention of cholera, is obtained by observation and conversation with eminent medical and scientific gentlemen, and from all that I can gather on the subject, it appears to be a fair conclusion that—the existence of cholera is due to an absence of a proper proportion of pure oxygen in the atmosphere, and hence the purification of the blood and generation of heat in the body is diminished; and as the body possesses a strong affinity for sulphur, and sulphur possesses a strong affinity for oxygen, the use of sulphur attracts and restores the oxygen to the body, and the proper generation of carbonic acid, which, together with the laxative and diaphoretic action of the sulphur, purify the blood, keep up the heat of the body, and prevent cholera.

A more active remedy than sulphur is required to cure the cholera, but the use of sulphur as I have stated, will prevent an attack of the cholera, and therefore I send you this communication under the truth of the maxim, old yet substantial, that an ounce of prevention is worth a pound of cure. Yours, &c.,

W. W. H.

Philadelphia, Jan. 12th, 1853.

Form and Heat of the Earth—North West Passage.

Messrs. Editors.—I have lately noticed an article going the round of the papers, relative to a new theory, which I think is open to objections. It is that which contends for the existence of an open polar sea, and a warmer climate in those regions than we have heretofore been taught to imagine. The advocates of this hypothesis give a coloring to their conclusions by citing certain phenomena which have been observed in high northern latitudes, such as the flight of large flocks of birds to the north, currents setting northward, and so on, but they chiefly rely upon the theory of the igneous origin of our planet to prove their point. For instance, they say since the earth's diameter from pole to pole is shorter than its equatorial diameter, the distance of the surface at the poles from the centre being less, a proportional increase of temperature must follow, for if we descend below the surface at any point, even for a moderate distance, a considerable change is felt. Some, I believe, have gone so far as to suppose a concavity at its poles, giving the earth somewhat the shape of an apple, whence, according to their reasoning, an almost tropical climate would be found if we could only pass the intermediate barrier of ice, and arrive there.

Now, if we admit the only theory from which these hypotheses can receive the slightest support (and it is one which has received the sanction of some of the greatest scientific men of our own time.) I think it can be shown that they are entirely fallacious. The main point of this theory is, that our planet was originally a molten, liquid mass, and that by the radiation of its surface heat into space, the present crust was formed. Now, we can see no reason why the present crust should be thinner at the poles than at the equator. On the contrary it would be thicker, since, at the equator, the vertical sun's rays would always help towards maintaining the original heat, while at the poles the cooling down process could go on with little or nothing to counteract it. Hence we have two reasons why the cold should be very intense at the poles:—first, the absence of the sun's rays, and second, the greater distance of the surface from the intense heat. As for the concavity at the poles, no reason can be assigned why it should exist there any more than at any other points on the surface. A liquid, revolving mass will always assume the form of an oblate spheroid, unless, indeed, the centrifugal force is great enough to cause it to take the form of a ring, and even then, nothing but a remarkable uniformity of density will prevent its separating into parts. The figure of the earth has been determined with great exactness by mathematicians, and the amount by which it varies from an exact sphere is such as we would be led to infer from its known density, size, and rate of revolution. Yours, &c.,

H. H. Bates.

Geneva, Jan. 8, 1853.

[Our correspondent effectually disposes of the igneous theory affecting the fluidity of the seas at the poles; this theory, as advanced for an open polar sea, we have considered of no value; but the facts of currents, flocks of birds, and passages of northern whales, from the Atlantic to the Pacific Ocean by the Northern Seas, are evidences of an open sea at the north not to be overlooked. It is our opinion however, that there is no fixed open arctic sea.

High Price of Ships.

The "Saco Union" records the following recent sales:—

"We learn that Messrs. Bourne & Kingsbury, of Kennebunk, have sold their beautiful 'Northern Crown' for something above $82,000, which is $2,200 more than their price two weeks since. The ship Charles Humberston, mostly owned in Kennebunk, was sold last week in Boston, for $33,000; she is about 14 months old, has never been coppered, and after having made the owners two good voyages, has been sold for about $11,000 more than the original cost.

A Grand Junction Railway in Paris.

A league and a half of railway which is to girdle Paris, was opened on the 12th of December. The road was undertaken by five of the great companies, who subscribed each a million of francs, leaving the government to execute the whole, of which the cost is estimated at nine millions altogether. It will connect all the stations round the capital, and reduces the expense of transit of goods and travellers to a tenth of the present amount.

The first locomotive on the railroad from Bombay to Tanna took place on the 18th November, to the great astonishment of the natives. The road will not be formally opened till February.