Printing Textile Fabrics in Great Britain.

The following is condensed from a lecture lately delivered before the Society of Arts, London, by Joseph Burch :—

Calico printing was early practiced in India, but did not find its way to England until 1690, when a small printing factory was established on the river Thames near Richmond by a Frenchman. Soon after this such factories multiplied in the neighborhood of London. The printing was then performed entirely from wood engraved blocks of small size, and the operation was done by hand. The printer registered the block, and laid it down carefully on the cloth with his left hand, and then struck it a tap with a mallet. The first great improvement made in this art was by A. Bell, in England, in 1785, and was called the "cylinder machine;" it consisted of engraved rollers which impressed the cloth. The same principle of printing is now applied to newspapers and books.

Printing from engraved rollers by the cylinder machine has, in consequence of the great speed with which they deliver their impressions, become the ordinary method for producing cotton prints. The rapidity with which this really beautiful machine turns off, with unerring exactness, piece after piece, its miles of printing per day, is truly wonderful. Although it cannot accomplish the fancy styles of topical printing with that perfection which surface printing effects, yet to the cylinder alone is due the extraordinary cheapness of cotton prints.

In the year 1846 Bennet Woodcroft, now of the London Patent Office, invented the pneumatic process of printing deoxydized indigo in an artificial atmosphere, an invention which ranks amongst the greatest achievements of chemical science as applied to calico printing, and was successfully applied to the cylinder machine by Messrs. Hoyle & Co., of Manchester. It is known that in a gas, such as a common coal gas, the deoxydized indigo will remain liquid for a length of time, and only while in this state is capable of being absorbed by the cotton fiber, for as soon as the indigo takes up the oxygen it is instantly precipitated, and then no longer gives out its color. In order to preserve it in a liquid state after its application to the cloth, Mr. Woodcroft contrived a chamber, filled with coal gas, into which the cloth was passed at once from the machine, and where, after traveling over several rollers, the indigo was deposited. During its movement through the chamber the indigo remaining liquid was entirely absorbed by the capillary tubes of the fiber, and thus a depth of shade almost approaching to a black was produced from a color which, if printed in the ordinary way, would have been little more than an azure blue. The process, too, was completed in much less time than that usually required.

Shading in stripes has been very successfully performed by the cylinder machine from engraved rollers. This is done by mixing the different tones of color upon endless sieves before the color is applied by them to the roller, which afterwards, by the assistance of the "doctor" on its surface, completes the more perfect gradation and mixture of the tints.

The printing of woven carpets is a recent and novel application of the art. In operating on plain velvet pile and terry goods it is necessary not only to print the surface or end of the pile, but to cover the whole depth of it with color. The dimensions of the design are generally far beyond the ordinary size of common printing blocks, and the variety of shades of color required to work them out, renders the employment of powerful and accurate machinery a matter of absolute necessity. Mr. Burch uses a series of strong block-printing machines for this purpose.

The blocks employed for the printing of carpets are of greater dimensions than ordinary blocks. The largest used at present are 56 inches long by 27 inches wide. These blocks are prepared in the following manner :—

The design is transferred to checked or point paper, as designs for weaving are prepared. In like manner the surfaces of the printing blocks are prepared, by cutting them in lines each way, so as to form checks of a corresponding number of squares all over the surface, each block being made a fac simile of the others. This is done without any reference to the design. It is then only necessary to mark those squares on each block which represent on the point paper the particular color in which that block is to work. These squares are afterwards left in relief by removing the intermediate parts. Each block thus carries on its surface certain portions of the design, every colored square on the point paper being represented by the corresponding square on one or other of the blocks. The color is not furnished from flat sieves, but from rollers. Each section of the apparatus works with two blocks, which deliver their impressions on one table, taking up their color in passing to and fro over the color rollers as they are moved laterally by the traversing frames, where they are placed on springs, which raise them after they have been forced down upon the carpet. In the construction of the machinery very great accuracy is necessary to insure correct work. After the carpet is dried it is taken to the steam-box, in which it is hung for two hours, and subjected to the action of steam at considerable pressure.—This softens the colors and fixes them to the fabric, and is analogous to the boiling operation in the process of dyeing. The carpets are afterwards washed by machinery for two hours, to remove the superfluous parts and the thickening of the colors. They are then dried, dressed, sheared, and finished for the market. They are woven by a power loom, Sievier's invention, which raises the pile without the use of a wire.

Manchester and Glasgow are the two great cities for printing textile fabrics. Mr. Burch says of them :—

"The Glasgow printers are ahead of their competitors. Many circumstances have conspired to this. If there be any new process or machine, inquire for it in Glasgow; you will not find it in Manchester. Manchester desires no improvements; is content to jog on in the old track. Glasgow seeks and encourages novelty. If quantity alone is wanted, it is to be obtained in Manchester: but if quality and quantity are required, we must go further north. The delaine trade, the handkerchief trade, the shawl trade, and the muslin trade, are now principally in Glasgow hands, and they do them well."

It is a fact which cannot be doubted, that those manufacturers that are always on the alert for new improvements, and who patronize new inventions keep the lead of all others, just as Glasgow now leads Manchester.

Lord Palmerston and the Cort Family.

Mr. David Mushet writes as follows to the *Mining Journal*, respecting the movement now in progress for raising a fund for the descendants of Henry Cort, the great improver of the iron manufacture :—

"I may refer with great respect to the courtesy, accessibility, and kind consideration evinced by Lord Palmerston since this case was first submitted to him, and further shown by his lordship's grant, last week, of a pension to Mr. Richard Cort. It is true, the amount is small, and it can only be considered as a preliminary installment. But this acknowledgment of the claims is the more gratifying, and shows the entire goodwill of his lordship in duly appreciating the case, because he had previously expressed his fear that it would be utterly impossible, out of the very small yearly sum placed at the disposal of the government of the British empire for the reward of merit, and the numerous immediate demands on it, to spare any portion for the Cort family. His lordship's deed has, therefore, proved better than his word. It is no small satisfaction to possess a Premier who has reversed the old adage of the unperformed promises of statesmen.

"I think it also a very incumbent duty in this prosperous position of the case, to express the sense of gratitude which all right-minded Britons must feel to the editor of the SCIENTIFIC AMERICAN, for his cogent remarks upon the Cort miracle, on Dec. 15th last, and in subsequent numbers. A more energetic appeal was never put in print. The voice which was then heard resounding across the Atlantic has proved no small aid in our efforts to awaken the British mind from its deep and strange mesmeric sleep regarding the author of inventions 'now used in manufacturing bar iron in every civilized country under the sun. All nations are his debtors; the benefits conferred on them by his inventions are beyond calculation.' I sincerely trust no Englishman may ever forget to do equal justice to American inventors, especially when visiting the shores of their ancestors, under the sacred claims of hospitality."

Iron Frames for Vessels.

The Philadelphia *Ledger* says :—Seven years since a steam propeller was built at the Penn Iron Works of Messrs. Reaney, Neafie & Co., which was most appropriately named the *Novelty* from the peculiar mode of its construction. The hull was built on a plan invented by Capt. R. F. Loper, dispensing entirely with timber in the construction of her frame, and substituting iron. These ribs were corrugated in their center to increase the strength, and had flanges on either side, with holes drilled for the purpose of securing the timber by means of screw bolts. The *Novelty* was completed, and has ever since been in use on the transportation line between this city and New York. The experiment has been a most decided success. The annual outlay for repairs has been much less than required by vessels of the ordinary construction. She is now considered as good as new, and would be ranked by underwriters as A No. 1, while steam vessels constructed at the same time wholly of timber, and used in the same trade, have so much deteriorated that their steam machinery has been removed, and the hulls are now used as barges only."

Cold Regions Extending.

It is well known as a matter of history that when Greeland was discovered it possessed a much warmer climate than it does at present. The ice-packs have been extending south from the polar regions for some centuries, and the north-east coasts of our continent are now much colder than they were three centuries ago. The cause of this is not well understood, the fact only is known. It is believed by some persons that there is a great eddy in some part of the polar ocean which sometimes changes its direction, and by drifting large icebergs from one place to another change the climate of those places whence they are drifted by the presence of such masses of ice diffusing their low temperatures to great distances.

In the month of July last the White Sea was blocked up with huge mountains of ice, and the commerce of Archangel stopped—something which never happened before. In the Faroe Islands snow fell in the valleys in the middle of July, the like of which also never happened before. If this drift of ice continues regularly for a few seasons the coasts of the White Sea will become as inhospitable as those of Greenland now are.

Paper from Moss.

Dr. Terry, of Detroit, Mich., who has been experimenting on half a tun of moss obtained in Lake Superior region, according to the Cleveland *Plaindealer*, affirms that it makes beautiful white paper without any peculiar process. The moss is represented to exist in great quantities on Isle Royal, and several other localities in the vicinity, and can be procured at a very moderate cost.—[Exchange.

[There is no difficulty in obtaining plenty of cheap materials from which to manufacture paper. The great question is one of cost in the manufacture.

The common grasses, wood, and other vegetable substances that have been experimented with, cost so much to reduce them to pulp, remove their natural gum, and to bleach them, as to render paper made from them more expensive than that from rags.

Aluminum Becoming Cheaper.

The *Builder* (London) states that this metal which a short time since was nearly as dear as gold, has already become cheaper than silver. Tea and coffee pots, spoons, &c., made of it are to be seen in the jeweller's shops of Paris.

Blowers for Cooling Boiler Rooms.

The boiler rooms on board of steamships are like bakers' ovens, and the life of a fireman on them is most laborious and exhausting. Any useful improvement to keep the boiler rooms cool would be one of the most humane inventions that could be introduced into steam navigation. We learn by the London *Mechanics' Magazine* that Charles Wye Williams, of Liverpool—author of a work on boilers and the combustion of fuel—has taken out a patent for employing fans operated by a small auxiliary engine, not only to promote draft in the furnaces when required but to ventilate every room, especially the boiler rooms on steamers. Such an application of the blower or fan for ventilation should be adopted by every steamer, and it would pay, we think, to be applied to California sailing vessels to prevent sweating between decks, which is the cause of so much injury to goods shipped from this port to San Francisco. This principle of ventilation is common property; all that is covered in England by Mr. Williams' patent, is the particular means he employs for regulating the amount of draft—the currents—by pipes and valves.

Velocity of Air in a Vacuum.

Air rushes into a vacuum at the surface of the earth with a velocity of 1338 feet per second. This is the same velocity with which steam rushes into a perfect vaccum in a condenser. According to the perfection of the vacuum so will be the rapidity of the exhaust; thus, if the vacuum be only 13 lbs., instead of 15 lbs., then the velocity of exhaust will only be 1137 feet per second. The quick condensation of steam in a vacuum is therefore necessary to the efficiency of a condenser; Scott Russell, in his work on the steam engine, asserts that a vacuum may sometimes be too good, and attempts to prove his point, but his proof is equally good against the use of a vacuum upon any consideration.

The velocity of the air rushing into a vacuum, is computed from its known weight or pressure of 15 lbs. on each square inch at the earth's surface. A homogeneous atmosphere of the same density throughout as at the earth's surface, extending 27,818 feet high, weighs this much, therefore a body falling from this hight acquires the velocity of 1338 feet per second. This law is equally applicable to the falling of water.

Epidemic Among Fish.

A curious phenomenon has just exhibited itself among the finny tribe in some of the rivers of Michigan. It is announced that during the past month the shores of Grand river have been strewed with dead and dying fish of unusual size. The same epidemic prevails in the Shinaase. This is the second time during the present season that the waters of these streams have been thus scourged. A few months ago every form of creeping thing known to that country was cast dead upon the banks, in great numbers. Lizards of enormous size and offensive appearance were piled in heaps where they were thrown by the eddying current. Rats, snakes, and almost every species of slimy monster shared a like fate. Now, however, the disease is confined to the fish.

Steam Accident.

On the night of the 31st ult. while the large steamboat *Bay State* was proceeding on her trip from this city to Fall River, the huge walking-beam of her engine broke at the center, the head of the cylinder was crushed, and the steam rushed out, instantly killing a little girl who was looking at the engine, besides severely scalding several other persons.

The boilers and engine-rooms of all our steamers are too much exposed. They should be formed into bulkheads enclosed in plate-iron. Were this improvement to be carried out on steamboats, many accidents would be prevented. Such an accident as the above very seldom happens, however.

Heating with Air.

Air and gases are very imperfect conductors of heat, which appears to diffuse through them as in liquids, the heated molecules ascending as they become rarified; hence the true philosophy of admitting hot air to rooms at the lowest part of the floor.