Chinese Printing.

The following article from Munsell's Typographical Miscellany, will be read withmuch interest :—

The Chinese claim a very high antiquity for their art of printing. Even in the reigon of Wu-Wang, who lived about 1100 years before Christ, they are said to have been well acquainted with it. The Japanese, however, claim the merit of the invention. In Thibet, also, the art of printing was practiced at a very remote date. The pretensions of these nations to so early an invention of their rude art, has led many learned commentators to treat their claims with very little respect, and to fix a more recent period for its introduction. But it does not seem, upon reflection, to be so very marvellous that any nation, however rude, should have hit upon a process of printing at any period. On the contrary, it is matter of wonder that the Egyptians, the Grecians, and the Romans, with all their wisdom, and all their necessities for such an art, should have remained ignorant of it. It had been the custom for thousands of years to make impression with seals upon wax, yet no active mind grasped the hint, that a mighty art awaited the touch of genius to spring into being. Who can concieve what would have been the state of the world in our day, had those nations possessed the art of printing!

The mode pursued by the Chinese in their practice of the art of printing is thus described by the author of Sketches of China. It may be thought very rude; but when it is considered that every character in their language is a word, it will be seen that the introduction of separate types would be attended with small advantage.

"The means in use among the Chinese for producing an impression of letters appears to be nearly the same with those invented in the infancy of the art. Blocks of hard wood, or masses of metal forming a kind of stereotype, are printed from, by a simple and expeditious process, and solely by manual labor, as presses for the purpose are entirely unknown.—The Canton Gazette, a kind of court journal of appointments, arrivals, and departures, is one of the few publications which are printed from moveable types. The blocks which are mostly used for engraving these stereotypes upon, are made of hard and well seasoned wood, divided into slabs, in the direction of the grain. The subject to be engraved is carefully written or drawn on thin paper, and pasted reversed upon the board; the wood is then cut from around the characters, and the letters remain in low relief. Much care is used in adjusting the written pattern, as it is not possible to rectify a mistake on copper or other metal.—The cost of engraving depends entirely on the size and delicacy of the letters, the price increasing in proportion to the smallness of the type. The equipments of a printer are very simple and cheap, and the operations less complicated than almost any other mechanical process. The board or slab of wood is placed on a table before the workman, and a pile of dry paper, cut to the proper size, at his side, when, with a rude bamboo brush, a coating of liquid Indian ink is put upon it; a sheet of paper is then placed on the top, and the impression completed by rubbing it over once or twice with a kind of vegetable fibre; the sheet is then lifted off, and the process repeated with the next. The paper used is very thin, and is only printed on one side, the sheet is folded with the blank sides, in contact, and the edges are bound into the back of the book, making it resemble a volume, the leaves of which are uncut; the paging &c., is on the external margin. In this simple manner, all the books and engravings on wood are printed, and a skillful workman is able to produce the impressions with as much celerity as our own, with the use of the press. Works of minor consequence are generally executed in a flimsy and imperfect manner, the printing of some being very indifferent at first and nearly unintelligible by the time a full edition has been taken off. The price of books is low, and there are numerous book shops and stalls in all the principal streets. The binding is very different from our own, the covering being merely soft paper, and the title carefully written on the bottom leaves. Five or six volumes are enclosed in a paste board case, and the books arranged on shelves, so as to present the titles to the front. Spurious editions are said to be very common, and I have never discovered that there was any protection of the copyright by law; consequently numerous incomplete copies of the orginal are circulated. Works are sometimes met with, the letters of which are white, on a black ground, the character being cut, as in a copperplate engraving, below the surface. There are in most cases, specimens of the various kinds of writing, intended as copies to write from, as well as some school books."

Among a collection of Bibles which we have made in about twenty languages, is one in Chinese in 4 vols.

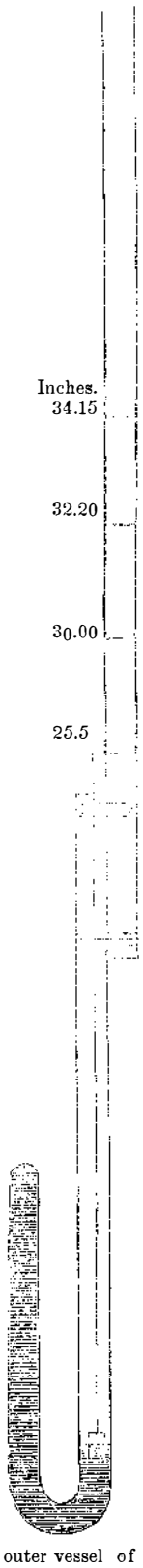
The Hand-Loom Weaver and The Power Loom.

More than a hundred years before the invention of the steam-loom in the Philosophical Transaction for August, 1678, there was given some account of "a new engine to make woollen cloths without the help of an artificer,"—being a communication from a M. de Gennes, "an officer belonging to the sea." Much ingenuity is exhibited in the mechanical construction of this "engine," considering the time it was produced; but in those days the only method of passing the wool thread through the warp, was by the finger of the weaver, assisted occasionally by a notched stick. And accordingly, M. de Gennes, or whoever was the inventor of the machine, could hit upon no better plan than the complicated imitation of the human hand and arm by which his shuttle is carried from side to side. Long afterwards, a common weaver invented the "fly shuttle," which is shot to and fro by springs, and modern inventors having the benefit of this capital discovery, started from high vantage ground, and have succeeded in bringing the power-loom to its present state of excellence. But the difficulty with which a novel idea is caught or worked is not the only one which stands in the way of an inventor. Improve our mechanism as we may, the human operator will always form an important element in our combinations, and will often prove by far the most intractable of our materials. Once let the workmen be inured to the routine performance of duties on one machine, and it becomes a work of much time and cost to transfer him to another. The dearly acquired skill which constituted his chief capital is rendered useless; and the apprenticeship to his new tasks must be completed at much labor to himself and expense to his employers. We are assured by high authority that little short of a whole generation must expire before the change can be thoroughly established.—When some of the more remarkable inventions, like those of Arkwright's spinning-jenny, were first introduced, it was found necessary to discard the whole of the trained operatives, and to entrust the attendance upon the new machines, either to young children, or to recruits drawn from rustic neighborhoods, who had never touched a spindle. It was no wonder that the "skilled laborer" of the old system denounced and resisted the new; just as the old English archer resisted the introduction of the musket, after having acquired by incessant practice from earliest childhood—his unerring skill as a marksman, and so great muscular power that he could be recognised a mile off, merely from the size of his arms. The spinning-jenny, indeed, presented such an enormous increase in speed and economy, that the old workers gave in without a struggle. But the weaving machines did not appear at first so hopelessly superior. The hand-loom weavers found themselves able to "live in the race" with the steam engine, although at a terrible sacrifice. The competition has been persevered in, with melancholy pertinacity to the present day; until society has the burden and the scandal of a numerous class of individuals, industrious but ill-judging, who have, even in good times, to battle for a bare subsistence against fearful odds; and who, in the frequently recurring periods of depression, present the most afflicting spectacle.

In this country the only field for the hand-loom weaver seems to be "the weaving of rag carpets"—in the city of New York there are a great number employed on their own account. Their shops are all in cellars, and they are chiefly Scotchmen, and Irishmen from Ulster. They seem to belong to another age, and when they depart their looms will be silent forever.

Newly Discovered Properties of Heat in Combination with Steam.

Our readers will remember that we published (some time ago) the report of Prof. Horsford, Cambridge College, Mass., upon a pamplet submitted to the Rumford Committee of the University, the said pamphlet being the production of Mr. James Frost, Brooklyn, N. Y., describing a new discovery made by him, whereby all the old theories on steam were overturned. We now present some facts in relation to the same, to explain the nature of his discovery. These are taken from his pamphlet. The principle of the discovery is this :—It has been held to be a fact that steam to be expanded to double its volume, required 480 extra degrees of heat, and he has discovered that it only requires 4 extra degrees of heat, when heated out of contact with water, and the rate of expansion doubles in volume by an addition of a root of heat, that is, if 4 degrees doublethe first volume, it requires only 2 to double the second, and this new property of steam and heat he denominates "*Stame.*"



The present diagram represents a bent glass tube, sealed at the shorter end, a very small drop of water having been first introduced into the shorter sealed end thereof, that end was filled with mercury. This eudiometer having a wooden handle, a cork float and index wire, covered with thread introduced therein, was prepared for experiment

The shorter end of the eudiometer was immersed in a vessel of cold water, the vessel placed over a fire, and when the water boiled, small quantities of common salt were added at intervals, while the water was boiling, and until it was saturated and maintained the stationary heat of 228° for a few minutes, whereby the greater part of water being superfluous, was expelled with the mercury from the shorter to the longer end of tube without disturbance, and and a full volume of pure steam, rarified and expanded by the heat of 228° was retained in and filled the shorter end of tube, while the greatest height of the index wire was marked on the wooden handle.

To estimate rightly the actual extent and value of the expansion of a definite volume of steam in this eudiometer, it becomes necessary, first, to define, obtain and fix upon some well known and definite unit of steam, and a volume of steam will be formed under atmospheric pressure and temperature 212°, which will faithfully represent a full and definite unit volume of atmospheric steam in the eudiometer,—provided, that at the time of observation, the surface of the mercury in the shorter end of tube stands on a level with the mercury in the longer end of tube, both ends being immersed at the time in boiling water. This adjustment may be very conveniently and accurately obtained by employing a double boiler or Balneum Maria, the outer vessel of glass connected to a metallic bottom. Such a glass cylinder should be of much less diameter, but of twice the height of the outer metallic vessel, and filled with water, which will be maintained at the boiling temperature of 212°, by the greater heat of the saline solution at 228° in the outer vessel.

For in this transparent boiler and liquid, the quantity of mercury in the respective ends of the tube may be seen, the instrument may be withdrawn therefrom for adjustment, and very nicely adjusted and replaced. The index shows the different volumes of steam in the eudiometer due to the different temperatures of 212° and 228°, which being marked on the wooden handle, the intermediate volume at 216° may be readily obtained by a subsequent addition of such small quantities of salt to the fresh water bath, as will secure a fixed boiling temperature of 216° therein.

That diagram exhibits the unit of atmospheric steam accurately, and its apparent or visible increased expansion by heat, but not the real expansion, which being greater than the apparent, has still to be obtained by calculation and by increasing the apparent in proportion to the increased densities of the steam, according to the well known law of Mariotte, "that the volumes of all elastic fluids at the same temperatures are proportioned to their densities," and when that proper allowance has been made, the absolute expansion in the eudiometer will be found to correspond very nearly indeed with our previous general statement.

(To be Continued.)

Note.—We have some of Mr. Frost's pamphlets, which will be found very curious and interesting; the price is 25 cents.

The Atmosphere.

The atmosphere rises above us with its cathedral dome arching towards the heaven, of which it is the most familiar synome and symbol. It floats around us like that grand object which the Apostle John saw in his vision :—"a sea of glass like unto crystal." So massive is it, that when it begins to stir, it tosses about great ships like play-things, and sweeps cities and forests like snow flakes, to destruction before it. And yet it is so mobile, that we have lived years in it before we can be persuaded it exists at all, and the great bulk of mankind never realize the truth that they are bathed in an ocean of air. Its weight is so enormous that iron shivers before it like glass, yet a soap-ball sails through it with impunity, and the tinest insect waves it with its wings. We touch it not, but it touches us; its warm south wind brings back color to the pale face of the invalid; its cold west winds refresh the fevered brow, and make the blood mantle in our cheeks; even its north blasts brace into new vigor the hardend children of our rugged clime. The eye is indebted to it for all the magnificence of sunrise, the full brightness of mid-day, the chastened radiance of the gloaming, and the clouds that cradle near the setting sun. But for it the rainbow would want its triumphal arch, and the winds would not send their fleecy messengers on errands round the heavens. The cold ether would not shed its snow feathers on the earth, nor would drops of dew gather on the flowers. The kindly rain would never fall—hail, storm, nor fog diversify the face of the sky. Our naked globe would turn its tanned unshadowed forehead to the sun, and one dreary monotonous balze of light and heat dazzle and burn up all things.

Cotton Grown in spain.

The editor of a Barcelona newspaper says he has had an oppertunity of seeing some samples of cotton which was cultivated on the banks of the Guadalquivir, the superior quality of which can compete with the best that is imported from the American continent. He recommends that the cultivation of this most useful plant be extended to every part of the peninsula of Spain; the soil and temperature of which he says, are calculated to give rich results. The editor flatters himself that an intelligent speech lately made by Don Felix Rivas before the agricultural society, at Madrid, may produce the effect of extending the cultivation of cotton.

The chamois and ibex are found on the Alps as high up as 9,000 feet. The goat of Cashmer browses at a height of 13,000 feet above the level of the sea, and the Pamir sheep live at an elevation loftier than the granite peak of Mount Blanc.