Arts, Manufactures and Machinery.

Mechanical Principles — Utility of Machinery and Manufactures.— The addition they make to human power —Relative power required to move a block of stone 1080 *lbs.*

There is perhaps, no single cirsumstance which distinguishes our country so remarkably from all others, as the vast extent to which we have carried our contrivances of Tools and Machines for forming all those conveniences of which so large a quantity is consumed by almost every class of the community. The amount of patient thought, of repeated experiment, happy exertion of genius, by which our manufactures have been created and carried to their present excellence, is scarcely to be imagined. If we look around the rooms we inhabit, or through those storerooms of every convenience, of every luxury that man can desire, which deck the crowded streets of our larger cities, we shall find in the history of each article, of every fabric, a series of failures which have gradually led the way to excellence; and we shall notice in the art of making even the most insignificant, processes calculated to excite our admiration by their simplicity, or to rivet our attention by their unlooked-for results.

The accumulation of skill and science that has been directed to diminish the difficulty of the production of manufactured goods, has not been beneficial to that country only in which it is concentrated; distant nations have participated in its advantages. The luxuriant natives of the East, and the ruder inhabitants of the African desert, are alike indebted to our looms. The produce of our factories seems to have preceded even our most enterprising travellers.

We propose to give a detailed account of the various Manufactures which are carried on in this country, and a description of the the tools and machinery by which their operations are conducted. Previously to this, however, we shall endeavor to state the principles on which their success depends, and to trace the consequences of the application of machinery to supersede the skill and power of the human arm.

The utility of Machinery and Manufactures seems to arise from the ***addition which they make to human power:—the economy of human time;—and the conversion of substances apparently the most common and most worthless, into very valuable products.***

With respect to the first of these effects, the forces derived from wind, from water, and from steam, present themselves to the mind of every one; these are, in fact, additions to human power, and will be considered in a future number: there are, however, other sources of its increase. by which the animal force of the individual is made to act with far greater than its unassisted powers, and to these we shall at present confine our observations.

The construction of Palaces, of Temples, and of Tombs, seems to have occupied the earliest attention of nations, just entering on the career of civilization; and the enormous blocks of stone moved from their native repositories to minister to the grandeur or piety of the builders, have remained to excite the astonishment of their posterity, even long after the purposes of many of these records, as well as the names of their founders have been forgotten.

The different degrees of force necessary to move these ponderous masses will have varied according to the mechanical knowledge of the people employed in their transport; and that the extent of power required for this purpose is widely different under such circumstances, will appear from the following experiment, which is related by M. Redelet, *Sur L'Art de batir*. A block of stone was taken for the subject of experiment, weighing 1080 lbs.

1. Weight of stone. 1080 lbs.

2. In order to drag this stone along the floor of the quarry roughly chiselled, it required a force equal to 758 lbs.

3. The stone dragged over a floor of planks required 652 lbs.

4. The same stone placed on a platform of wood and dragged over a floor of planks, required 606 lbs.

5. After soaping the two surfaces of wood which slid over each other it required 182 lbs.

6. The same stone was now placed upon rollers of three inches diameter, when it required to put it in motion along the floor of the quarry 34 lbs.

6. To drag it by these rollers over a wooden floor required 28 lbs.

7. When the stone was mounted, on a wooden platform, and the same rollers placed between that and a plank floor, it required 22 lbs.

From this experiment, it results, that the force necessary to move a stone along the smoothed surface of its quarry is nearly as two-thirds of its weight; to move it along a wooden floor, three fifths, by wood upon wood five-ninths; if the wooden surfaces are soaped, one-sixth; if rollers are used on the floor of the quarry, it requires one-thirty-second part of the weight; if they roll over wood, one-fortieth: and if they roll between wood one-fiftieth of its weight.

At each increase of knowledge, as well as on the contrivance of every new Tool, human labor becomes abridged. The man who contrived rollers, invented a tool by which his power was quintupled. The workman who first suggested the employment of soap or grease, was immediately enabled to move without exerting a greater effort more than three times the weight he could before. So sensible are the effects of grease in diminishing friction, that the drivers of sledges in Amsterdam, on which heavy goods are transported, carry in their hand a rope soaked in tallow, which they throw down from time to time before the sledge, in order that by passing over the rope it may become greased.

(*To be continued.*)

For the Scientific American.

Woodworth's Patent.

GENEVA, May 19, 1848.

Mr. Editor:—I am wishing to obtain some reliable information respecting the validity of the claims which have been recently set up by the proprietors of the Woodworth Planing Machines Knowing your facilities for procuring such information has induced me to make the following inquiries, viz. Whether rotary cutters for moulding sash, &c. is an infringement on the Woodworth planing machine? Also whether Fay's Tenoning Machine is an infringement? These machines have been in use in this part of the country from fifteen to twenty years unmolested. Mr. Judd, of this village, purchased one of the tenoning machines, seventeen years ago to my knowledge, with the right of use, but all at once the proprietors of the Woodworth Patent have discovered that they are an infringment, and are forbidding the use of them, and all the rotary cutters, in general use for manufacturing wood work Now I would not infringe on any man's rights knowingly, and if these claims are valid it is important for the public to know it in order that people may understand all the impediments to embarking in an enterprise of the kind. If they are fictitious it is equally important that they may avoid being imposed upon.

When I entered into the business of manufacturing by machinery I had not the least suspicion that there would ever be any claims set up on machines that had been in use so long unmolested, neither do I believe that there is a shadow of foundation or justice in their claim. It seems to me great injustice has been done to the public by the extension of the Woodworth patent. Was it for the benefit of the heirs, or for an overgrown monopoly a portion of whom are now stretching forth their strong arm to crush all those honest and industrious mechanics who have innocently engaged in a laudable pursuit for a livelihood—for instance, requiring one fourth of all the earnings of a machine and adding such other restrictions as none but a slave would willingly submit to. I have been notified by Mr. Gibson that if I run my cutters for moulding and tenoning sash and blinds another minute he would commence a suit against me immediately. When proof is shown me that I am infringing on the Woodworth patent, I will submit and close up my business, but to the contrary I shall stand my ground as long as I have a cent left. If I have a correct idea of the Patent Law, any man has a right to take a portion of the principles of a patent machine and make a different application of them from those specified in said patent without infringing If it were otherwise inventors would soon come to a stand, for where do we find a new invention that does not combine something that has been in use before; for instance rotary and crank motion which have been in use from time immemorial. It would be a weakness in a man to argue that either of these principles in themselves constitute any portion of their claim to a patent as these are the fundamental principles from which all machinery is driven. But to one more point. Would the Woodworth patent machine for planing, tonguing and grooving boards and plank be valued if the testimony of Hale, Emmons and others were justly considered. I think not.

It is surprising to me that a monopoly of this kind after having fattened out of the public for fifteen or twenty years should be suffered to coil itself around our members of Congress so as to be permitted to fasten its huge paws on the community for many years to come, without a remonstrance against it.

I shall now drop this subject until occasion requires it to be alluded to again, when further facts may be brought to light that will not be relished by those who are fond of displaying their power and authority over the heads of the poor but innocent mechanics.

Yours respectfully, P GAYLORD.

[Mr. Gaylord will find our sentiments expressed in the article "Rights of Inventors," on another page.—ED.

The Jacquard Machine—Its Invenior.

At the recent soiree of the Bolton Mechanics' Institute, England, Dr. Bowring told the interesting story of Jacquard the inventor of the loom. He said, "I do not know, my friends, whether you have heard the name of Jacquard or the Jacquard loom, which introduced so great an improvement into the manufacture of silks. I saw the old man only a few days before his death. The city of Lyons in which he was born, and in which he had been terribly persecuted during his early life, felt that it was due to him to make his declining age happy, and they gave him a liberal pension, which enabled him to pass the evening of his life in tranquility and peace and to purchase a pretty villa, to which was attached a beautiful garden, where I had an opportunity of hearing from his lips the history of his own experience. Perhaps you will allow me to repeat to you a few remarks of that extraordinary man, made to me, seated with him in his own bower, fairly and truly under the shade of his own vine and his own fig tree, and on a beautiful summer evening when the sun was setting, and when the decline and setting of that sun reminded me that the sun of Jacquard was setting also, for he was weak, and about to be lost to his generation. Jacquard was a straw manufacturer in the city of Lyons, he was a poor man, and he had received little instruction.

During the war with England there was an article appeared in the French Moniteur, which stated that a person in England had offered a large sum of money to any person who could produce a machine by which a net could be made. This set him to work, and he did get over the great difficulty of producing a machine by which a knot could be tied. The thing was forgotten, and by some accident this net was given to the great Emperor Napoleon, and he was told that a poor man on the banks of the Rhone had solved a very great problem. Jacquard, in great poverty one day and scarcely knowing how to exist, was surprised by the visit of a sergeant of *gens d'arms*, who knocked at the door. He came down stairs, and the sergeant said, "I have orders to take you to Paris." He said, "Who has sent for me at Paris?" he was told "Why, you will hear that when you get there. There is a carriage waiting for you." He said, "I must send for my wife, and make preparation:" but the serjeant said, "No, you must go as you are;" and he was taken to the palace of the Tuileries, and introduced immediately to two persons no less distinguished than Napoleon Bonaparte and his great minister Carnot. Napoleon said, "They tell me you say that you can tie a knot in a straight string (for that is the art of knitting,) by a piece of machinery; I don't believe you." He continued, Now, in order to try you, I will have you locked up in an apartment and supplied with materials upon which to work, and everything you require to make your machine."

Well, Jacquard set to work, so locked up and constructed a machine, was covered with honor, continued to direct his attention to mechanical arts, and afterward produced that machine which bears his name, to which I have referred, and which improvement in the loom, by merely throwing the shuttle across the warp, produced the most beautiful patterns. These machines produced a revolution in France; twice they rose upon Jacquard, and twice they attempted to drown him in the Rhone. There was the same violence in this country. There was a crusade against knowledge and improvement, and nothing but the power of those who were his friends could have secured his life from danger, or his person from outrage. He withdrew himself from the world for many years still attempting to be the benefactor of his native land. Opinions changed, however, and, as I told you, before he died, he was the recipient of a liberal pension, not only from the city of Lyons but from the French government. He died upon the property which was conveyed to him, the grateful gift of the people he had honored and elevated and when he was carried to his tomb, the city of Lyons declared that his portrait should be painted and hung up in the School of Arts where I have seen it. This is an encouragement for all men not to be deterred from great undertakings by the rash and intolerant spirit of a moment; but to feel that the prejudices of time will pass away, and that he who does honor and service to his country, will be acknowledged as his country's benefactor."

Science and Religion.

Rising from different sources, Science and Religion are like two mighty rivers, seeming sometimes to run in opposite directions, but yet tending to empty their waters at the same point into the same ocean. Already are they seen to approach each other; words of friendly salutation are exchanged across the isthmus which yet divides them, and the pennons which gleam from the vessels of those who float on their surface, are found to contain mottoes of similar import. On the one side I see it written, Great and marvellous are thy works Lord God Almighty: and on the other, Just and true are thy ways, O thou King of Saints: and when these two currents shall unite, then shall there go up from the blended multitude, as the sound of many waters, the one undivided song of Moses and the Lamb.

George Canning.

George Canning never forgot the humble mother that bare him. So soon as his resources would permit, he made ample provison for her support; and for years after he entered Parliament, and even when a foreign ambassador, he wrote her a weekly epistle, breathing the kindliest affection. Though he could never elevate her tastes and associations above the connections of her youth, he used to throw aside the cares of office, that he might visit her, and the humble cousins with whom she dwelt, at Bath, and there when in the zenith of his fame, would walk out, with his plebeian relatives, and receive the homage of his lordly visitants at that fashionable resort, in their company. This marks him a noble man. He delighted in literary pursuits—would drop the pen when preparing a diplomatic despatch, to talk over the classics with his university acquaintances—was a brilliant essayist and wrote Latin and English verses with much grace and beauty.

Those that are of high birth are respected; their very name is a sort of panegyric to them and this is one of the greatest privileges a man can desire But give us the man who has raised himself to fame—the root and not the branch of greatness.