Consequently the engine would do what the gentleman considers absurd, viz.—Use most horse-power when doing least work, and least horse-power when doing most work.

The method he gives us for computing the power of an engine exclusive of friction is equally erroneous, as he supposes the friction to be the same, whether the engine is doing work or not, which is evidently wrong.

Again he says, "It must be admitted that a better test of the superior economy of one man's make of engine over another could scarcely be had than that of the amount of steam consumed in running any engine alone." I believe that the gentleman is also mistaken on this point. The fact is that a toy engine, like the one of which you give an illustration on the same page on which the gentleman's article appeared, would run with less steam alone than the most perfect engine yet made, on account of the simplicity of parts. I think it capable of demonstration that the poorest engine would run alone with the least steam, and also that a very bad engine may show a good card by indicator. B.

Newark, N. J.

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Large Centrifugal Pumps.

MESSRS. EDITORS:—In a recent number of your paper you published an extract, from the *Colliery Guardian*, about two large centrifugal pumps which had lately been made in England, and which were said to be the largest in the world. The writer of the article in question cannot have been very well "posted" as to the dimensions of some of the large pumps at present in operation—as I know of two (and there are probably others), each of which exceeds in size those described in the article referred to. These pumps are at present at work on the sugar estate of Messrs. Ewing, of Glasgow, in Demarara, and were made from the designs of Prof. James Thomson, C. E., Belfast, Ireland. The larger of the two was constructed under my supervision by Messrs. Harland & Wolff, Belfast, and as some of your readers may desire to know some of the particulars I give you the principal dimensions. Diameter over all, 15 feet 6 inches; diameter of wheel, 7 feet 9 inches; breadth of wheel at periphery, 2 feet 7½ inches; diameter of shaft, 7½ inches; diameter of suction pipes (2), 4 feet 9 inches.

St. Louis, Mo. JAS. SIMPSON.

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THE LAW OF STEAM.

BY PROF. JULIEN M. DEBY.

Regnault, the celebrated chemist and natural philosopher, in the published results of his admirable researches on steam, undertaken at the requisition of the French Government, while speaking of the intimate relation existing between the pressure and the temperature of steam, says: "The question we are at present studying is probably one of the least complex of the theory of heat, and if the law which governs it has not been made manifest by our experiments, this depends probably on the empirical definition given of *temperature*, which definition, in all likelihood, does not establish any simple relation between various temperatures and absolute quantities of heat."

He further says: "We are at present totally unacquainted with the theoretical law which connects the elastic forces of vapors with their temperatures."

Dalton, long before Regnault, propounded a law, stating that, while the pressures increased in geometrical ratio, the temperatures did so in an arithmetical one; and Faraday, to a certain extent, corroborated Dalton's theory during his investigations on the expansion of gases. More recent observations have, however, proved the fallacy of this supposed law, especially when applied to long ranges of pressures or to great differences in temperature.

Neither the researches of Arago and Dulong, nor those of the Franklin Institute, nor of other modern physicists have, to our knowledge, been able to solve the mystery, and we have, to this day, been reduced either to direct experiment or to the use of empirical formulæ in order to determine the temperature of any given pressure of steam, or, *vice versa*, to determine the pressure from the temperature.

The formulæ for this purpose are quite numerous; but as I have said before, they are, without exception, purely empirical; and their results must be considered only as rough approximations to practical results. Many of these formulæ are complex, involving quantities to be raised to the fifth or sixth power or require the extraction of the fifth or sixth root, and combine the use of various constants and coefficients with multitudinous rows of decimals attached to them.

How much more simple the matter really is, I shall now proceed to show, leaving those who take interest in the subject to judge for themselves, whether or not Dame Nature has long mystified the mathematicians in this special case.

While reflecting on the theory which regards heat as a mode of motion, it occurred to me to think of the cause of the well-ascertained fact, that the latent heat of steam decreases as the tension increases, and this naturally led me to the conclusion, that, in all probability, as the pressure of steam increases so is a portion of the latent heat really converted into this pressure itself, or, more properly speaking, the tension is in reality itself only modified latent heat.

Expressed mathematically, if such be the case, no matter what the tension is, we have: Tension of steam (a certain amount of motion) + latent heat of same steam (a certain amount of motion) = total amount of heat (total motion) in steam.

In order to ascertain if I was right in my supposition, I took up—not any of the tables calculated by the formulæ of various authors, but the results of direct experiments made by the most reliable scientific authorities—and I soon had the satisfaction of discovering that I had, to all appearance, solved the gordian knot.

The tension of steam, or its elastic force, does not present any natural simple relation to either thermometric temperature or to the total units of heat supposed to be contained in steam, but is most intimately related to its latent heat, a portion of which, in fact, it really is. According to my views, the simple law reads as follows:

While the pressure of steam increases in a geometrical progression, the latent heat decreases in an arithmetical progression, and vice versa.

If the pressure in atmospheres be as 1, 2, 4, 8, 16, 32, etc., the corresponding diminution in latent heat will be, respectively, as 1, 2, 3, 4, 5, 6, etc. The same would occur with the series 3, 6, 12, 24, 48, 96, etc., or 5, 10, 20, 40, 80, etc., or any other

If we take 537 C. units of caloric as the quantity of "latent heat" in steam, indicating 100° C. on the thermometer under atmospheric pressure, we find that the difference between the terms of the above arithmetical progression is 17, or a number which approximates to it within a very minute fraction.

This number of 17 units of heat is an average of the differences found by me to exist between a large number of the carefully *observed* temperatures, noted by Arago, Dulong, and Regnault, as corresponding to *observed* pressures.

It gives us:

Pressure in atmosphere.	Latent caloric.
1	537 units.
2	537—17
4	537—17 × 2
8	537—17 × 3
16	537—17 × 4, etc.

By interpolation, I have formed the following table, showing the latent heat (which may always be readily calculated from the thermometric indications, by means of Regnault's formula T ·305 + 506·5 for Centigrade degrees, or (T—32)·305 + 911·7 for Fahrenheit degrees, and the corresponding pressures of steam in atmospheres, from 1 to 16. The temperature is also readily calculated from the latent heat by the formula T=606—L÷·695, in which L represents the units of latent heat.

The letter A indicates the units of latent heat of steam of 100° C., or 212 Fah. or of atmospheric pressure, and *b* indicates the number corresponding to the difference between two terms of the arithmetical progression. I shall here only exhibit the Centigrade series in numerals.

Pressures in atmospheres.	Corresponding units of latent caloric.	In general.
1	537	A—*o*
2	537—17	A—*b*
3	$537-(17+\frac{17}{2})$	$A-(b+\frac{b}{2})$
4	$537-(17\times 2)$	$A-(b+b)$
5	$537-[(17\times 2)+\frac{17}{4}]$	$A-(b+b+\frac{b}{4})$
6	$537-[(17\times 2)+(2\times\frac{17}{4})]$	$A-(b+b+2\frac{b}{4})$
7	$537-[(17\times 2)+(3\times\frac{17}{4})]$	$A-(b+b+3\frac{b}{4})$
8	$537-(17\times 3)$	$A-(b+b+b)$
9	$537-[(17\times 3)+\frac{17}{8}]$	$A-(3b+\frac{b}{8})$
10	$537-[(3\times 17)+(2\times\frac{17}{8})]$	$A-(3b+2\frac{b}{8})$
11	$537-[(3\times 17)+(3\times\frac{17}{8})]$	$A-(3b+3\frac{b}{8})$
12	$537-[(3\times 17)+(4\times\frac{17}{8})]$	$A-(3b+4\frac{b}{8})$
13	$537-[(3\times 17)+(5\times\frac{17}{8})]$	$A-(3b+5\frac{b}{8})$
14	$537-[(3\times 17)+(6\times\frac{17}{8})]$	$A-(3b+6\frac{b}{8})$
15	$537-[(3\times 17)+(7\times\frac{17}{8})]$	$A-(3b+7\frac{b}{8})$
16	$537-[(3\times 17)+(8\times\frac{17}{8})]$	$A-4b$.

I am at present occupied in computing the latent heat of all pressures, from 1 to 16 atmospheres and up to 1,000ths parts, which will furnish more complete data than any extant.

In order to facilitate at once to others the verification of my statements, I will limit myself to showing how the 10ths, 100ths, and 1,000ths are interpolated by an example.

PRESSURE FROM ONE TO TWO ATMOSPHERES.

TENTHS.

		Units.
Atmospheres	1	537
"	1·1	$537-\frac{17}{10}$
"	1·2	$537-2\times\frac{17}{10}$
. . .	. . .	. . .
"	1·9	$537-9\times\frac{17}{10}$
"	2	537—17

HUNDREDTHS.

		Units.
Atmospheres	1	537
"	1·10	$537-\frac{17}{10}$
"	1·11	$537-(\frac{17}{10}+\frac{17}{100})$
"	1·12	$537-(\frac{17}{10}+2\times\frac{17}{100})$
. . .	. . .	. . .
"	1·99	$537-(9\times\frac{17}{10}+9\times\frac{17}{100})$

THOUSANDTHS.

		Units.
Atmospheres	1	537
"	1·101	$537-(\frac{17}{10}+\frac{17}{1000})$
"	1·102	$537-(\frac{17}{10}+2\times\frac{17}{1000})$
. . .	. . .	. . .
"	1·999	$537-(9\times\frac{17}{10}+9\times\frac{17}{100}+9\times\frac{17}{1000})$

I have applied my formula to most of Regnault's practical observations, taken high and low in the scale, and find the discrepancies to be really insignificant.

He gives, for instance, pressure 1·905 atmospheres; observed temperature, 119·16; latent heat, 523; I find 521,615, or a difference of only 1·385 units. Another is T = 119·16; pressure, 1·924 atmospheres; latent heat, 522·2; I find 521·292 units, or a difference of 1·008 units.

Among the higher pressures, we find: Pressure, 13·344 atmospheres; temperature, C., 193·8; latent heat, 472·2. We here, by our theory, have 473·662, a difference of 1·42 only; and again, P = 13·625; T = 194·8; latent heat, 471·2, when I find 474·047, a difference of 2·847 units.

The above are only a few examples, taken at random from among many, to serve as a verification of my law, but all those I have tried have approximated as closely to the practical results of experiment as those we have just quoted.

I have rapidly penned the present notice for the purpose of eliciting the opinion of others upon this important and interesting subject.

In a future article I may furnish various practical formulæ in connection with it, and will enter into the discussion of the relation existing between, so-called, latent heat and the volume of steam, as also its connection with the present theory of expansion and condensation, all of which we hope to show, have the most intimate dependence on its amount.

Let us conclude by reminding the reader, that we are, in all probability, fast approaching the day when it will be admitted by all sound philosophers, that only one law exists in nature, MOTION, the modes of which are familiarly known as heat, light, electricity, chemical affinity, molecular forces, gravitation, innervation, etc., all of which will be found to be perfectly convertible into one another. This will constitute a sufficient proof of their identity.

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THE SEWING MACHINE---ITS ORIGIN AND SUGGESTIONS FOR IMPROVEMENT.

In the year 1825, there lived in the city of Saint Etienne, in France, a poor and obscure tailor whose patrons were few and far between. His carelessness about the work intrusted to him, joined to his eccentric habits, obtained for him throughout the neighborhood an unenviable reputation, the natural consequences of which were that his business declined from day to day and he ended by becoming a veritable pauper. In 1827, he was considered as laboring under the constant influence of hallucinations, and in 1829, he was unanimously regarded by the gossips of his precinct as insane.

This madman was no other than Barthlemy Thimonnier, the inventor of the first sewing machine. He was born at Abreste in the year 1793, and was the son of a dyer of Lyons.

It is an old custom with many manufacturers of the south of France, to give out large quantities of needle-work and embroidery to the country girls residing around their establishments. This attracted the notice of Thimonnier and originated in his mind the first idea of a sewing machine. On its construction he worked without help or money during four successive years, at the expiration of which, in 1830, he obtained his letters patent.

A government engineer by the name of Beaunier, living at Saint Etienne at the time, examined the machine, and appreciating at a glance the value of the invention, took the tailor with him to Paris, where a firm was soon started under the title of "Ferrand, Thimonnier, Germain, Petit & Co., with a view to the profitable working of the patent.

In 1841, in the Rue de Sevres, might have been seen a workshop, in which eighty wooden sewing machines were constantly employed in making army clothing.

That same year, however, the tide of a fierce revolutionary outbreak swept over France, and the laboring men of the capital, in their blind and ignorant fury, saw in this new substitution of machinery for manual labor, nothing but a means of robbing their wives and daughters of their daily bread. The consequence was exactly the same as in the case of the canal boatmen of Münden, who destroyed the first steamboat started there in the year 1707, and of the Belgian weavers, who some years ago broke up the first flax-spinning machinery imported from England into the city of Ghent. An armed and infuriated mob smashed all of Thimonnier's machines, and he himself had to flee for his life.

Soon after this Beaunier died, and the firm of Germain, Petit & Co., was dissolved leaving our poor tailor out in the cold.

In the year 1834, Thimonnier returned to Paris, and having improved his machine, attempted to make a living by taking in sewing. In this, however, he failed, and was at length obliged to walk all the way back to his native home with his machine upon his back, exhibiting it as a curiosity along the road in order to enable him to purchase his daily meals.

After this sad experience it would be thought Thimonnier would have given up the matter in despair, but, on the contrary, he went to work and constructed several new machines which he disposed of with the greatest difficulty.

In the year 1845, the date of Howe's patent in America, the French machine was already making two hundred stitches a minute

M. Magnin, of Villefranca, at this crisis joined our inventor, and furnishing the necessary funds, the construction of ten-dollar machines was at once begun by them, with a fair prospect of pecuniary reward. In 1848, these machines made three hundred stitches per minute, and could sew and embroider any material from muslin to leather inclusive. The woodwork had now also been replaced by metal.

In the memorable month of February, 1848, another convulsion of the people took place in France, and for the second and last time were Thimonnier's hopes of success entirely blighted, himself and his partner being completely ruined by it.

He sold his English patent to a Manchester company for a trifle, sent his best machine in 1851 to the great London Exhibition, but too late to be noticed; and, finally, after thirty years of a life of incessant struggle and adversity, he died at the age of 64, in the greatest poverty, on the 5th day of August, 1857, at a place called Amplepuis.

While our poor tailor was starving in Europe, the sewing machine was being perfected on a new principle, in the United States, and in 1845, Elias Howe, Jr., obtained his patent out of which he eventually made quite a large sum of money.

Since 1852, American sewing machines by various makers have taken the premiums at all the shows, and were soon known and appreciated over the whole civilized world. At the present time improved machines, together with a few original patterns, are manufactured in England, France, Germany, and other countries, some of which are not surpassed by our own, being compact, cheap, and simple, and work rapidly and efficiently, If our manufacturers wish to contribute to the wants of the outer world in sewing machines, they must apply their energies and ingenuity to perfect their machines as some of them appear to be doing.

A good needlewoman with her needle makes from twenty-five to thirty stitches per minute, while a modern sewing machine will make one thousand ; and yet we cannot call this last a *labor-saving* machine, so far as regards the operator on it. As compared with sewing by hand, the sewing with the machine is a really very laborious and fatiguing occupation.

A general law of mechanics is that whatever we gain in speed must be compensated by increase in power. For every extra stitch over the twenty-five or thirty mentioned above, a greater effort will be needed from the operator, until she may occasionally be taxed to her very utmost.

Increased power in this case is increased muscular action ; muscular action needs fuel for combustion in the human machine ; fuel for combustion means increased expense for daily food, a strain on the digestive organs, or a certain and dangerous physical waste of the individual. Our stage and street car horses are changed several times a day, but sewing girls at their machines are expected to work for ten or twelve consecutive hours with intermittent but continually repeated motions of the muscles of the lower limbs. Persons express surprise, if the remark be made that the poor operator is actually wearing herself out, and this much more rapidly than the slight movements she is making would seem to indicate.

We have before us a very interesting report, addressed to the "Société Médicale des Hopitaux," in 1866, by Doctor Guibout, on the sanitary condition of the many sewing machine operators which came under his personal notice in the public hospitals of Paris. Hollow cheeks, pale and discolored faces, arched backs, epigastric pains, predisposition to lung disease, and other special symptoms too numerous to be specified, were found to be the general characteristics of all the patients.

In the public houses of correction, where the female prisoners are obliged to work at sewing machines, in order to contribute toward diminishing the public cost of their detention, it has been found indispensable to issue to them supplementary rations over the usual diet of the establishments in order to keep them in good health.

These disastrous effects must eventually tend toward the deterioration of our race, and deserve, in a humanitarian point of view, the most serious consideration of all friends of mankind.

The way to remedy these evils is simple enough, viz., to make the sewing machine an automotor. In large establishments, where numbers of them are in daily use, steam has been applied with success, simple contrivances allowing them to be stopped or their speed to be increased at the will of the operator. Steam, however, is unavailable in private dwellings ; and here we meet with a need which American inventors ought long ago to have fully and satisfactorily supplied, that of a "family" automatic machine.

The only really practical device of the kind with which we are acquainted (and this leaves much to be desired), is the electro-magnetic automotor invented in France by H. Cazal, which occupies so little space that it may be hidden under a foot stood. The fact that the cost of combustion of zinc is thirty times higher than if the power had been obtained by the combustion of coal, is to a certain extent compensated by the advantages of absence of boiler, fires, smoke, smell, or dust. Four of Bunsen's elements are sufficient for driving an ordinary sewing machine at a cost of fifteen or sixteen cents per day.

The apparatus itself consists in an iron pulley with an externally toothed rim, which revolves freely within a metallic ring, toothed similarly to the pulley, but on its internal surface, so that the points of the teeth of the pulley, face and approximate to those of the outer circle. An insulated wire runs over the pulley, which thus becomes a magnet whenever an electrical current is run through it, and ceases to be so from the very instant that the current is interrupted.

While the current from the battery is active, each of the teeth of the pulley attracts its opposite on the rim, and if the current were to remain constant, each of these would remain *in situ* and no motion would be imparted to the wheel; to avoid this, a commutator, which is set in motion by the motor itself, regulates the passage of the electrical current through the wire and renders it intermittent. As soon as the apexes of the teeth have placed themselves into opposition, the current ceases and the teeth on the pulley proceed onward, when a fresh current forces them into a second opposition with the next set on the rim, and so on indefinitely, producing a very satisfactory rotary motion. The power being symmetrically disposed around the axis and in each tooth, there is very little friction on the bearings and no noise produced. The speed can be varied at will, and the simple pressure on a knob or button causes instantaneous stoppage.

It is our conviction that electro-magnetic, or other small motors, fit for many domestic uses, could easily be devised, superior to even the simple machine of Cazal. We recommend this subject to the immediate attention of our mechanics and engineers. Should they succeed, they will have found not only a source of wealth for themselves, but they will have contributed their mite towards alleviating some of the thousand hidden miseries incident to our modern civilization, and will thus have acquired a right to the gratitude of their laboring brothers and sisters.

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SHAFTING, PULLEYS, AND BELTS.

Improperly hung shafting, unbalanced pulleys, and crooked and badly constructed belts absorb an amount of the power used for manufacturing purposes that would probably, if known, astonish the most observant. When it is considered that this power is costly—costly not only in the first means for its utilization, as in the construction of a dam, flume, wheel, etc., when natural water power is employed, but eminently costly when the source of power itself is an item of continual expense, as in the employment of steam—it will be conceded that the subject of saving the amount now wasted from imperfection in the means of its transmission, cannot be of merely slight interest. Too many of our shops and manufactories present a spectacle, anything but pleasant to the mechanical eye, in sprung shafting, cut boxes, inefficient belts, unbalanced pulleys, shafts of insufficient size, and a general lack of evidences of intelligent arrangement and proper management. Some, it is pleasant to say, are models in all these respects ; the manager allows no leaks to escape his observation ; from the source of the power to its ultimate delivery, every step and every means are carefully scanned and kept in perfect order. For such, any directions we may give, any advice we may offer, any suggestions we may make, are superfluous. We write the following for others.

Before selecting the iron for a shaft, or for several lines with their counters, the machinist or millwright should take into consideration the weight each section of shaft is to sustain in the size of pulleys and strain of belts, the distance between points of support (boxes), the velocity of the shaft, and the nature of the machinery it is to drive. In all cases the iron for shafting should be chosen for its homogeneousness and perfection of rolling, seen by the finish of its surface. Each section should be handled carefully in transportation. As it comes from the mill it is usually straight, or nearly so, but teamsters and dealers in iron bars seem to suppose that no more care is necessary in handling a bar calculated for shafting purposes than in treating so much scrap iron. Frequently the lengths come crooked, bent, and sprung, to the hand of the machinist ; they receive in transit no more consideration than the trunks of passengers on a railroad or steamboat at the hands of baggage smashers. It would be well for manufacturers of rolled iron for shafting, if they would follow the example of steel makers, or of Jones & Laughlins, manufacturers of cold rolled iron at Pittsburgh, Pa., and pack their bars in boxes. It would be well not only for them, but for the workman who is to convert these bars into shafts.

And here let us say a few words in favor of a most meritorious improvement, that just referred to, *en passant*, the cold rolled shafting. Its first cost is greater than that of the best refined iron ordinarily used for shafting, but it comes with a perfect finish, rolled to perfect size, without bend, kink, or spring, is ready at once to receive pulleys, and only requires centering and sufficient turning at the ends to give a shoulder for the couplings ; although if the coupling adapted for it and illustrated in No. 20, Vol. XVII, Scientific American, be used, the end turning may be dispensed with if not the centering.

But, passing from this style of nearly perfect shafting, let us look at the processes to be employed to produce proper sections where they must be turned. The first process is the straightening. To begin at the beginning, the shaft should be centered at the ends. It is evident this center must be found by the circumference. If the shaft is bent or straight, in either case the center should found and drilled, before any attempt to straighten the shaft is made. For this purpose the ends of the shaft should be squared. This is done preferably by the vise and file ; for if placed on temporary boxes in the lathe in order to use the side, or squaring-up tool, we do not know that the bearings of the shaft are true, and it cannot be placed upon centers until center holes are made, and this is our first object. Let the machinist take the shaft or bar to his vise, resting one end on the floor, and file by the trysquare until he has the end square with the longitudinal surface ; the center punch and dividers will give him the proper center. This, be it borne in mind, before any attempt at straightening is made. We are aware that a centering lathe is frequently used, and if used judiciously it is a valuable machine, even for crooked or sprung bars, but for those who have not this tool the plan above is sufficient.

The center being found, drill by the hand or breast drill, if a lathe is not convenient, a hole of about one-eighth of an inch diameter at least half an inch deep ; then chamfer or flare the hole with a cone-shaped drill, milled on its face—not a four-sided or three-sided tool, or a flat drill of two sides, but one circular to bear on every point at the same time.

The shaft is now centered, and is to be straightened. To determine how much out of true it is, suspend it between the centers of a lathe and rotate it by hand ; no dog is required. If sprung in a long sweep, put a block of solid wood across the ways of the lathe, with a hook bolt projecting above it at the rear end, and use a wooden bar as lever, placing one end under the hook, and at the other end apply your weight. Any crook not too short can thus be straightened. If short crooks occur, not manageable in this way, do not strike the iron cold on an anvil, but heat it to a red, or nearly so, and then straighten, not by the direct blow of the sledge, which will indent the iron, but through the medium of a hollow "former," the reverse of the "fuller," so that the iron is not injured.

We place great stress on this method of straightening kinks, as we know that not only is cold hammering injurious in indenting the iron, and injuring its texture, but that after these indentations are removed by the turning tool, if it goes so deep, the crooks sometimes return, like curses, to vex the peace of mind of the ignorant or careless workman. Turning the shafting must be deferred to another time.

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BEET ROOT SUGAR IN THE UNITED STATES.

The *Evening Post* (Chicago), in noticing our announcement that we would give a series of practical articles on the manufacture of beet root sugar and expression of our belief that Yankee beet root sugar will, at no distant day, be offered in the markets of the world in successful competition with both colonial and European brands, admits it to be "a very comforting and encouraging fact, if fact it shall prove to be." It, however, throws some doubt upon the probability of successful beet root sugar manufacture here, based upon the very partial success hitherto attained in the attempt at such manufacture up to the present date. It says: "The establishment at Chatsworth, in this State, which was hailed when first begun as a certain triumph of low priced land and a home market over the competition of cane-growing districts, has had anything but an encouraging experience. A very large sum of money, probably not less than $300,000, has been expended by the company, but, thus far, without anything like the expected return. It is said that all the causes of failure are easily explained—that a bad crop of beets in one year, insufficient and defective machinery in another year, a want of water in a third year, will account for the continued inability of the works to pay."

Those acquainted with the history of this establishment, and who have a knowledge respecting the details of the manufacture, will readily admit that the causes assigned are ample to account for the "inability of the works to pay." These works are, however, doing better than the *Post* seems to think. It is stated, that during the last year they made a million pounds of sugar, which ought not to imply anything like imminent bankruptcy.

The *Post* states strongly the difficulties which attend the introduction of new industries, and shakes its head doubtingly thereat. But there are plenty of precedents to reassure it and other doubters. Of these we will instance only one, the silk manufacture, now a profitable and permanently-established industry on this continent. Surely, on the score of failures in the few and imperfect trials hitherto made in the beet root sugar manufacture, we find little to give reason for doubt when we remember the numberless failures and discouragements that obstructed the earliest attempts at spinning and weaving silk. It is hardly fair, however, to consider the only attempts worthy of the name, yet made in this country, as failures until it shall be proved beyond a doubt, that they have not only been doing business at little profit for the limited time they have been in operation, but have lost, and must continue to lose, from the insurmountable obstacles they are forced to encounter.

This has not yet been demonstrated, and the very fact that, notwithstanding the misfortunes of the works alluded to, it has kept its head above water, is, we think, evidence that it will not soon be demonstrated.

In this connection, it may not be amiss to give some figures from the New York *Shipping and Commercial List*, showing the extent of the sugar trade in the United States for 1868. The quanties are given in tuns of 2,240 pounds:

	Tuns.
Received at New York	259,073
Received at Boston	62,237
Received at Philadelphia	66,120
Received at Baltimore	53,458
Received at New Orleans	10,706
Received at other ports	10,380
Total receipts	461,974
Stock, January 1, 1868	45,746
Exports and inland shipments	8,246
Stock, January 1, 1869	41,942
Consumption of foreign in 1868	446,533
Consumption of foreign in 1867	378,068
Crops of Louisiana, Texas, etc	33,000
Total consumption of cane sugar for 1868	479,533

"The crop of Louisiana, now about made, is estimated at 100,000 hogsheads. The season has been unusually favorable—so much so that at one time strong hopes were entertained that the yield would reach 125,000 hogsheads ; but the weather has recently been unpropitious, and the estimates have been reduced to the first mentioned figures.

"The insurrection in Cuba will interfere materially with the supply from that quarter. The crop of maple sugar in the United States the last year will be about 23,000 tuns, though the data is imperfect upon which the estimate is made. The production of sugar throughout the world, including the beet sugar of Europe and the palm and date sugar of the Indies, for the year 1867, is estimated at 1,299,600 tuns, of which Cuba produces nearly one-third ; of this Great Britain and her colonies consumed about 689,000 tuns, and the United States 467,300 tuns—the two nationalities consuming nearly one-half of the world's supply."

It will be seen that the foreign sugar consumed in 1868 in this country exceeds that of 1867 by 68,465 tuns, or more than the increase in home production, although the season has been unusually favorable. We do not believe the American people will content themselves with dependence upon foreign countries for this important staple, when there is no solid reason for so doing. With our fertile soil, and fertile brains, it will go hard if we do not make beet root sugar supply our own consumption, with some to spare for export. Let us not expect too much from the brief experiments yet made ; we have planted only a few small seeds, it is not yet time for the reaping.