

THE Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Agents, "The American News Company," Agents, 121 Nassau street New York.

VOL. XIII., NO. 19...[NEW SERIES.]... Twentieth Year.

NEW YORK, SATURDAY, NOVEMBER 4, 1865.

Contents:

(Illustrations are indicated by an asterisk.)

*Babbett's Bolt Cutter.....	287	The Teeth of Wheels.....	293
*Puddling Iron by Machinery..	287	Foreign Summary.....	293
Application of the Spectral		*Gorton's Axle-setting Machine	294
Analysis to Astronomical		Iron Cow Stalls.....	294
Phenomena.....	288	*Harper's Gas Lighter.....	294
Shot-making in New York.....	289	Petroleum in Europe.....	294
A Singular Casualty.....	289	Market for the Month.....	294
*Carter's Portable Engine.....	290	Apprentices and Journeymen	295
*How American Locomotives		Grave Charges Against the	
are made.....	290	American Institute.....	295
Award of Premiums at the		Why Rents are so High.....	295
Fair of the American In-		Increase of Wealth.....	295
stitute.....	292	Renewal of the Winooski and	
The Way to Zinc Cast Iron.....	294	Algonquin Trial.....	295
*Straightening Gun Barrels		Recent American Patents.....	296
Illustrated.....	292	Patent Claims.....	296, 297, 298, 299
Zincing Cast Iron.....	293	*Sweetland's Horse-power.....	302
An Acknowledgment.....	298	*Greell, Bez, and Stoll's	
The Most Reasonable Explana-		Gate.....	302
tion of the Razor Question	293	Expansion Vise.....	302

APPRENTICES AND JOURNEYMEN.

A statement has been extensively published that the "New York Convention of Trades' Societies, now in session at Albany, are considering the subject of regulating by law the relations of apprentices to journeymen." This means, we suppose, for no explanation is given, that apprentices are to be bound for a certain period, or otherwise compelled to serve masters or at trades which they abhor.

It is stated that the object of this action on the part of the Society is to advance the interests of the workingman; make him more proficient in his business; to correct the evils of half-bred mechanics—in a word, to relieve any trade from the odium it has incurred by inefficient members, and supply it with good ones. Such objects are extremely praiseworthy, but they are unattainable by the means proposed. Men cannot be legislated into skillful mechanics. It is an old saw that "one man can lead a horse to water, but forty cannot make him drink." So if a youth has no natural aptitude for his business, a law cannot enforce what nature has denied him. Laws cannot make poets, or painters, or machinists; and the talent of good workmanship, though not down in the calendar of virtues, is as much of a distinction as any in the gift of the muses. It is intended to "regulate" mechanics by law; to legislate their talents down to the level of others who are naturally mediocre, and forbid them to exercise their own views, or opinions, or talents, except at the will of their masters. What preposterous folly! The capital of an employer is his bank account. The capital of a mechanic is his hands and brain; the mechanic is hidden in the apprentice, and develops by judicious encouragement and treatment—not by being kept down at the bidding of any worshipful society of tradesmen in the world.

If a youth is naturally uneasy and restive, restraint will not improve him; compulsory daily attendance on his trade will not cure him. It is idle to suppose that manual dexterity can be secured by law; to assert that a mechanic can fit in a gib and key neatly because some legislators say he must. In India mechanics are regulated by law. He whose father was a tailor must be a tailor also. Caste, the social barrier, prevents him from being any thing else. What is the consequence? The workman receives a beggarly pittance, and the product of his toil is the rudest.

In the State prison are men who make shoes on compulsion, but we never heard that they were specially skilled in their art; that the goods they made were other than the commonest, or that they were devoted to their occupations. The surest way to break up any trade—to destroy a spirit of progress—to reduce mechanics to human machines—is to regulate them by law. Let them alone! More work is

obtained from one willing apprentice than from a dozen compelled to labor; and if the Society of Tradesmen study their own and the public interest they will seek to procure youths who *desire* to learn trades—not impress and enforce servitude on those who do not.

GRAVE CHARGES AGAINST THE AMERICAN INSTITUTE.

On another page will be found a communication from one of the exhibitors at the recent Fair of the American Institute, alleging that rival exhibitors who received premiums were managers or officers of the Institute. If the managers can deny this allegation, our columns are open to them for the purpose; if they are not able to deny it, they are unworthy of their positions.

When the Institute invites rival manufacturers and inventors to present their articles before it for competition, it is most clearly with the understanding that the merits of the articles shall be judged by an impartial tribunal. What manufacturer would go to the great expense and inconvenience of transporting heavy machinery to the Fair, and operating it there, if he knew that his competitors were to sit upon the committee that had the power of awarding the premiums?

No man with a proper sense of personal honor would consent to occupy a position in which he would be required to adjudicate between himself and others. Whenever a judge has a case come before him in which he has any interest, however slight or indirect, he refuses to try it. The late decision of the Supreme Court of this State in regard to the liability of National Banks to taxation, was unanimous with the exception of one judge, who declined to give his opinion, on the ground that he was an owner of stock in a National Bank.

Unless the American Institute can clear itself from all suspicion of interested bias in its awards—its premiums, its Fairs, and the Association itself, will be regarded with universal contempt.

WHY RENTS ARE SO HIGH.

By our exchanges we see that the cause of the high rents in nearly all cities is the subject of much discussion, and many editors are abusing landlords for asking such exorbitant rates. This abuse is childish and ridiculous. Every one of these editors would, if in the place of a landlord, act precisely as the landlord does; that is, from a number of desirable tenants he would take the one who offered the highest rent. As human nature is constituted, all prices must adjust themselves by the relation of supply and demand. The principal cause of the present high rate of rents is very plain.

In the first place, rents should be nominally forty-six per cent higher than usual, in common with other values, because they are expressed in a currency which is depreciated to this extent. Secondly, there is sufficient reason why the inflation of the currency should operate to raise rents more in proportion than other values. If a capitalist considers the project of building a house to let, he sees that a ten-thousand-dollar house will cost him at the present time at least fifteen thousand dollars, thus involving a loss of five thousand dollars whenever the currency is restored to specie value—a loss equal to five years' rent. This consideration has operated for the last four years to such an extent as almost to suspend the erection of buildings. As the population of the country during the same period has continued its rapid growth, with not even a perceptible check from the war, the demand for houses has outrun the supply, and the natural and inevitable result is an advance in rents.

It is curious to observe how inflation of the currency in a civilized community extends its disturbing influence into all the relations of life.

INCREASE OF WEALTH.

The wealth of the world, ever since the creation of man, has been increasing more rapidly than the population; it is increasing at the present time more rapidly than ever before; and in the new States of this Union it multiplies more frequently than any where else. As one instance, we give the following statistics in relation to the State of Michigan, show-

ing the population, the wealth, and the average property to each inhabitant at different periods:—

Year.	Population.	Valuation.	Wealth per capita.
1840.....	212,267	\$37,883,024	\$178
1850.....	397,965	74,968,344	188
1860.....	751,110	262,785,750	399
1865.....	820,000	319,872,305	390

The increased rapidity in the accumulation of wealth is not the result of the discovery of gold mines in California and Australia, but is owing to the larger employment of labor-doing machinery, and to the increase of intelligence, economy and thrift among men. The discovery of gold mines, by diverting a small fraction of the labor of the world from the production of wealth to the useless task of augmenting the currency, had a very slight tendency to check accumulation.

RENEWAL OF THE "WINOOSKI" AND "ALGONQUIN" TRIAL.

The trial between the engines of the *Winooski* and those of the *Algonquin* was renewed on the 23d ult., and continued till 2:10 P. M., on the 25th, when Mr. Dickerson ordered the *Algonquin's* engine to be stopped. In the morning before the engine was stopped, the counters showed, at the same time, 59,328 revolutions of the *Winooski's* wheels, and 60,566 of the *Algonquin's*, making 1,238 revolutions in favor of the *Algonquin*.

Mr. Dickerson has published a note giving his reasons for stopping. He says that it was agreed that the throttle of the *Winooski's* engine should be kept open throughout the trial, and that the engineers were evading this agreement by throttling off with the stop valves.

He says also:—

"The *Winooski* has gained an advantage of more than half a turn a minute by reason of losing her buckets in a collision with a coal barge—a collision that was permitted to take place with a knowledge that it must strip off buckets, and so give a great advantage to the *Winooski*, and which might have been prevented by stopping the engine for a moment."

Mr. Danby, President of the Board of Experts, before whom the trial was being made, has published a note in reply to that of Mr. Dickerson. He says:—

"About three or four hours before he stopped his engine, which was losing ground rapidly, Mr. Dickerson addressed the note in question to myself and the other two members of the Board of Chief Engineers, demanding the stop valves of the boilers of the *Winooski* to be carried wide open, with a threat that he would stop his engine in case it was refused. Mr. Isherwood, in order to save the delay and great expense to the Government of repeating this trial, at once waived his right, and the stop valves were placed wide open. After they were opened, Mr. Dickerson ran his engine about an hour, when, finding he was losing at the same rate as before, he abruptly stopped his engine, and so foiled the purpose of the experiment.

"Further, since the stoppage of the *Algonquin's* engine the *Winooski's* has continued running about twenty-four hours, with the stop valves wide open, and with equally as good results as with them partially closed.

"During the last thirteen and a half hours the *Winooski* had gained 597 revolutions upon the *Algonquin*.

"About forty-eight hours before Mr. Dickerson stopped his engine, a large coal barge belonging to private parties was drifted by the powerful ebb tide, in 'o the starboard wheel of the *Winooski*; but the damage extended no further than to fracture and splinter the projecting outer ends of the paddles.

"Soon after this accident happened—which was entirely unavoidable—Mr. Dickerson was given his choice whether the trial should be stopped or whether he preferred to go on. He examined the wheel carefully and the performance of the *Winooski's* engine, both before and after the accident, and preferred to continue—running forty-eight hours—when, seeing he was rapidly losing, he makes it an additional excuse, in his letter, for his wholly unwarranted conduct in stopping."

M. REGNAULT has succeeded in obtaining photographs with bromide, iodide and fluoride of copper; the bromide proved the most sensitive.