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## A NEW TEXTILE FIBER.

In consideration of the high price at which all varieties of textile fabrics are now held, it is important that the materials from which such sbrics are made should be increased in quantity. Cotton is almost out of the market. Until the war is ended, and the questions at issue decided positively, we cannot count upon another crop with any certainty whatever. Flax is beginning to come into the market to some extent, and factories to spin and otherwise work it up into wearing apparel are springing up in various parts of the land. The machinery required for this branch of industry is in great demand, and we hope ere long to see some substantial evidence of energy and enterprise in the shape of cheap, durable, and elegant linens. There is always a demand, however, for coarse, heavy, and strong bagging or crash. This has hitherto been supplied from the overflowing abundance of the cotton crop, but that being cut off and foreign materials being also high, it is necessary to look about for some addition to the list of fibers from which heavy sacking can be made. Such a fiber has been discovered in the husk of the maize plant, or indian corn which is grown in such abundance in this country. The husk which envelopes the ear is now used to a great extent in Austria for making paper. Immense quantities are made and the quality is said by competent judges to be equal to the best ragpaper ever manufactured. It is in the process of obtaining the paper stock from the corn-husk that the fiber is set free. Neither are injured but are separate and distinct products of the wonderful plant. The fabric which is woven from this fiber is immensely strong. Cordage is made from it and it bears some resemblance in color to the cocoa-fiber. Although far inferior to it in strength it is much superior in point of softness and elasticity. Some samples of cloth we have seen woven from this fiber would make excellent toweling or "crash" for covering carpeting. It is also valuable for making enameled cloth, or oil-cloth, and it takes any coating applied to it readily and retains it firmly. Specimens of enameled cloth made on this fabric as a base are equal to the best English cloths.

The very general interest which attaches to the discovery of a new material which can be used in the arts should lead manufacturers to look into this sub-

from this fiber alone (so we are assured on the authority of the Austrian Consul, Charles F. Loosey, Esq., of this city), have been shown us by the gentleman named. Samples can be seen at this office.

It will be seen that in addition to the paper stock, the husk of the indian-corn is capable of producing a marketable fiber, and still retain its value as cattlefodder, for in these processes the life-sustaining element is not lost but obtained in all its purity. The methods of weaving and of freeing the fiber from its vegetable envelope are not completed, nor is the expense great, and we are confident that good results will follow an immediate investigation of this sublect.

### THE MYSTERIES OF IRON.

There is no miracle recorded in the annals of any religion more mysterious, more incomprehensible, more inconceivable, than some of the well-known properties of the simple metal, iron. Consider, for instance, its change from its ordinary to its passive state. If a piece of the metal in its ordinary condition is immersed in nitric acid, it is powerfully acted upon, entering into combination with the acid and losing its metallic form. But if a piece of platinum wire has one end inserted in the acid, and the iron is then immersed in contact with the wire, it is so changed that the acid has no power upon it, and this condition continues after the platinum wire is withdrawn. The contact of a single point with the platinum sends a transformation through all of its particles which renders them invulnerable to the attacks of the most powerful acid. Even more wonderful is its change under the influence of a current of electricity. When a bar of pure soft iron is wound with an insulated wire and a current of electricity is sent through the wire, the bar is instantly converted into a magnet. It is endowed with an unseen force which stretches out from its ends, and seizing any other piece of iron within its reach, draws them to itself, and holds them in its invisible grasp. The obobject of insulating the wire is to prevent the electricity from leaving it, and yet through this insulating coat a power is exerted which changes so strange ly the nature of the iron, enabling it to act on substances with which it is not in coutact. As soon as the circling current ceases, the iron becomes like Sampson shorn of his locks, its miraculous power has departed.

Not less mysterious than either of these is the more familiar phenomenon of the fall of a piece of iron to the ground, under the simple action of gravitation. What is that invisible force which reaches out in all directions from the earth, and clutches all matter in its grasp? The fibers of this power are imperceptible to any of our senses. If we pass our hands under a suspended rock we can feel nothing reaching from it to the earth; and yet there is some thing stretching up from from the earth, taking hold of the rock, and drawing it down with the strength of a hundred cables! We walk enveloped in mysteries, and "our daily life is a miracle."

# AMERICAN RIFLE-SHOOTING.

The New York Times, July 15th, contains an article recommending the formation of rifle clubs in this country after the example of Switzerland and Germany, and remarks:—"We now stand in fearful need of better proficiency in the use of the longrange rifle."

This remark would be refreshing from an Englishman. Many foreigners have recognized the fact that the absence of game-laws in this country has made us a nation of marksmen. In what part of the country could the editor of the Times have been reared if he is ignorant of the fact that it is the first ambition of every country boy to be able to fire a gun, and that field sports are the most universal recreation throughout the length and breadth of the land. From Maine to Texas there is scarcely a farm-house that is not provided with its shot-gun and rifle, and few are the farmers' sons who grow up without being accustomed to the use of these arms. Nearly every town has its body of marksmen who meet during the fall months, and shoot at turkeys for twelve ject. It is in this state an Austrian discovery, and cents a shot. So rapid has been the improvement both

is a valuable one. Thousands of yards of cloth made in guns and marksmen during the last thirty years, that the regular distance for setting up the turkeys has gradually increased from one hundred yards to a quarter of a mile. What are the Swiss rifle clubs, or the occasional practice of a few thousand English volunteers, compared with this passionate devotion of an entire nation to a special amusement?

Let the editor of the Times start from the northeast corner of New England and travel westward to California, and he will find in every town at least a hundred men, each one of whom can take the falsemuzzle rifle invented by Mr. Clark, of Boston, and beat any Swiss, German or Englishman who can be found, at any range over four hundred yards.

### THE MONITORS.

The course of a large portion of the public press upon the monitor system seems to us exceedingly unreasonable. When the first vessel achieved her glorious triumph there was but one opinion, and that a favorable one, of the general plan and principle of the vessel. It is now suddenly discovered that of all iron-clad ships the monitor type is the worst, and the indignant guardians of public safety, who were once so zealous in the cause, loudly demand that some other plan be tried. We have no objections to make to this proposition; on the contrary we think it a good one. We have doubtless monitors enough for all present purposes and another class of vessel may be found to answer all the purposes that they do. But apart from this consideration there is nothing to be gained by decrying the vessels now. They are not inefficient. They are excellent ships for the service designed for them. They are invulnerable in their vital parts with the present ordnance, they stand the sea sufficiently well to go from point to point upon our coast, they are in all respects reliable and trustworthy for the work they have to do, and they have already done more than any other type of iron-clad afloat in the world. They have withstood storms of shot and shell that would have sunk any other iron-clad that ever floated, and can go through the same ordeal to-day. They have been blown out of the water by torpedoes, but in spite of it have gone on their way practically unharmed. It is nothing against them that they have achieved no very brilliant deeds of late. Captain Ericsson never contracted to put brains in his turrets, but if he had, no doubt a cast-iron head would have done as well as some others which have been in them.

The original monitor also comes in for a share of vituperation. The opponents of the system say that the Merrimac still continued to be a terror to the enemy long after her engagement, and that the Monitor was too weak to follow her into Norfolk. This was no fault of the turreted ship, but of her guns. She was constructed for heavier ordnance but none could be procured at that time. The eleveninch gun is rated with a heavier charge now than it was supposed to be capable of bearing at that time, and if the Merrimac was not blown out of the water she was at any rate morally destroyed. Foreign officers are now or have been recently examining these vessels. They are fully acquainted with the peculiarities of other iron-clads abroad, and they concur unanimously in the opinion that heavy guns cannot be protected or worked in any other way than under a monitor turret, and also that the strength of the armor over the battery must be concentrated. and that the turret offers greater advantages than any other system for this purpose. In view of these facts how can we seek to undermine the public confidence in the navy-an arm of the Government which has always commanded the respect and admiration of the people?

In the Evening Post of the 14th instant, a long leader on the monitors contains this sapient sentence: -"If the monitors can stand fire so can the Warriors -both are iron-clad, but the Warrior could run down a dozen monitors in succession and at her leisure, without getting seriously hurt." By a parity of reasoning we might say that if a steam carriage can go twenty-five miles an hour, so can a wheelbarrow, for both are wheeled vehicles. So far as regards the capacity of the monitors to withstand an attack of a heavy ram there is no reason to feel any apprehension whatever. The Warrior could not run a monitor down, for she draws too much water, and the

Mean gross effective pressure-

ths cut-off.
ds cut-off.
cut-off.
th cut-off.

smaller vessel could lay close aboard and by her heavy guns greatly damage her enemy, while she would be comparatively safe by reason of the small target presented. We speak not from prejudice but upon conviction. We have watched the career of these vessels as well as our contemporaries and we venture to think we are as ready to condemn them as they. We have been on board the vessels after the attack on Charleston, and subsequently, but we invariably found that, for reasons best known to the authors, the reports of their inefficiency and injuries were greatly exaggerated.

We have no desire to bolster up any vessel or any p enterprise that is unworthy of public confidence, but the merits of the monitors far outweigh their defects, and until some other plan is proved better worthy of consideration we shall continue to advocate their cause whenever and wherever it is attacked, at home or abroad.

## THE HECKER AND WATERMAN EXPERIMENTS.

We give this week an account of four experiments tried between the 12th of May and the 4th of June. the space around the thin walls of the cylinder being heated with steam from the boiler, the exhaust steam being condensed. The four points of cut-off were the same in all the experiments. The following are the

Total number of revolutions of the engine during

the

Total number of pounds of combustible consumed, adding coal and wood together and deducting the

%ths cut-off	1,212
%ds cut-off	1,069
32 cut-off	1,086
th cut-off.	959.5
Number of revolutions of engine per min	
Kths cut-off	43·181
\$7 de cont off	49.146
12 cut off	43-209
Kr cai-off.	43.124
Vacuum in condenser in inches per o	

vacuum in	condenser	in inches	per open gage-
mean—			
Kths cut off	•	• • • • • • • • • • • • • • • • • • •	27:29
3303 CDL-00.	• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	27 <sup>-</sup> 25 27 <sup>-</sup> 70
hth out off.	· • · · · · · · • • · · · · · · · · · ·	••••••••••••••••••••••••••••••••••••••	27-19
Mean hight	of baromet	ter during	each run—
Ktha cut of	<b>.</b>	<i>.</i>	
%da cat-off.	• • • • • • • • • • • • • • • • • • • •	. <b></b>	
X cut-08	• • • • • • • • • • • • • • • • • • •	. <b></b> . <b></b>	
hiths cut-off	[		
			arged by sir-num

an temperature of water discharged by air-pump

during each 30-hours run—	_
Kths cut-off	98.88
ds cut-off	98.32
is cut-off	104.38
Mean temperature of feed-water	
74ths cut-off	95-92
Wds cut-off	95 53
S cut-off	
hth cut-off	101.24
Mean temperature of engine-room-	_
%the cut-off	72 32
3ds cut-off	
% cut-off	
Lith cut-off	
Mean steam-pressure in boiler per	gage-
%the cut-off	
ids cut-off	25.41
th cut-off	47:51
· •	
Mean pressure in cylinder above tu	ll vacuum at
ginning of stroke—	
%ths cut-off	28-714

% ds cut-off	
% dis cut-off	36.181
14th cut-off	47 '02
Mean pressure at point of cut-o	ff—
%ths cut-off	
%ds cut-off	
½ cut-off	
Ath cut-off	
Mean pressure at end of stroke	_
%the cat-off	23:506
Kds cut-off	
th art off	16-772
The see off	94 000

%the cat-off	• • • • • • • • • • • • • • • • • • • •	23:506
3ds out-off	*************************	18.698
44 @B-0ff		16-779
%to car-oa	******	. N 083
	essure on piston	
Wha cut off		3.540
₹da cat-off		3:390
K cut of 5	<b> </b>	2:500
MED CORPOR	***************************************	2'45

	mean gross encouve pressure
	%ths cut-off23.413
	% ds cut-off
	25 909
	13th cut-off
	Gross effective horse-power per indicator—
	%ths cut-off 9-613
	%ds cut-olf9816
	½ cut-off10 160
	4th cut-off 9:958
	Total horse-power, including overcoming back
	pressure—
	%ths cut-off
i	23ds cut-off 11:217
	3 ds cut-off 11-21; 4 cut-off 11-754
	4th cut-off 10-970
	Net horse-power applied to fan, deducting back
	pressure and friction of engine
i	
Į	%ths cut-off
į	ads cut-off
	4th cut-off
	Pounds of feed-water per hour per total horse-
	power per indicator—
	%ths cut-off
	ads cut-off
	½ cut-off31.691
	4th cut-off
	Dounds of combustible new total indicated house
	Pounds of combustible per total indicated horse-
	power per hour—

It will be observed that an economy of nearly 25 per cent in fuel was effected by cutting off at 1th instead of  $\frac{7}{8}$ ths, the same work being done in both cases in the same time. But in cutting off at 3ds and at of the stroke, there was no material difference in the quantity of fuel. Next week we shall give an account of four 30-hour experiments, the engine being worked as a non-condenser.

# MISCELLANEOUS SUMMARY.

PORTIFICATORS. - The art of constructing earthworks has been wonderfully developed by our civil The Richmond papers speak of Butler's works at Bermuda Hundred as marvels of scientific intricacy. They consist ot high earth-works, desended by a ditch twelve feet wide and a perfectly impenetrable abattis, the trees and branches composing the latter being thick interwoven with wire. According to the rebel account, had there been no garrison defending this work it would have taken the rebel troops two hours to get into the intrenchments. Some of Lee's works at Spottsylvania were nearly as formidable, rendered so chiefly by the ingenulty displayed in the abattis. Grant's works in the siege of Vicksburgh were wonders of engineering skill.

CAUSE OF THE EXPLOSION OF GUN-COTTON AT STOW-MARKET. -The inquest on the two girls who lost their lives at the gun-cotton factory at Stowmarket, England, has concluded. It appears that the injury was caused by the ignition of the girls' dresses and not by the explosive force of the cotton. The ignition of the gun-cotton evidently arose from the heat produced by friction, possibly by some grit having got into the cartridge. The absurdity of Dr. Phipson's suggestion (published in the *Times* of June 18th), that it was caused by electrical action, is proved by the fact that the most powerful electrical sparks can be sent through a mass of gun-cotton without igniting it.—London Mining Journal.

THE great Iron Company of Marseilles have just completed, at their dockyard at La Seyne, near Toulon, an iron-plated steam gunboat on a new model. It has already been tried, and the result was most satisfactory. It may be easily separated into eighteen pieces, and each of these forms a small boat, which may travel over land or navigate the sea with equal facility. The gunboat, when entire, accomplished eight and a half knots an hour. When taken to pieces a whole fleet of gunboats may be moved from one place to another by railway at the rate of thirty-five miles an hour.

HARVEY'S theory of the circulation of the blood, or rather the causes of the circulation, is beginning to be disputed; for blushing, sudden paleress of the face, flushing and chillness of the body, frequently occur without any disturbance or modification of the heart's action. The steady movement of the blood in the capillaries, the circulation through the liver without the intervention of any propulsive force, the fact that after death the arteries are usually found empty, among other things, cannot be accounted for on the hypothesis that the heart is the sole mover of the blood. The new theory is that the action is a chemical one.

FORTUNATE ESCAPE.—Dr. S. G. Martin, of Syracuse, says that he made an engagement some weeks since to administer nitrous oxide gas to an elderly lady, for whom he was going to extract some teeth preparatory to making an upper set; but fortunately, as it turned out, the teeth had to be extracted without the use of the gas in consequence of the failure of an assistant to have it ready. The next day the lady was seriously ill with congestion of the lunge, and barely escaped death. The congestion would have been attributed doubtless to the effects of the gas had she taken it, and that she did not, may be set down as a fortunate accident for the doctor.

EXTRAORDINARY TIMBER. A lot of choice timber, such as we sometimes "read of," but seldom see, has been lying at the Michigan Central dock, Detroit, awaiting shipment. It is principally black walnut, and was cut in the vicinity of Downgiac. One of the sticks is 57 inches square, and a number of others are very nearly equal in size. Owing to the formidable size of the trees, wood-choppers long hesitated about "going in," but finally, under the temptation, we suppose, of the "high price of gold," the monarchs of the forest were laid low. They afford a fair example of what Michigan can do in the way of native productions.

A Brave Engineer.—A gentleman just returned from a trip to the West informs us, that while on a train some thirty miles from Chicago, the engineer, on approaching a bridge, discovered a child struggling in the water. With most heroic courage he instantly gave the signal for stopping the train, then running at a speed of thirty-five miles an hour, and jumped from the locomotive into the water. When the train had stopped, the brave fellow had rescued the child and was climbing up the bank of the river with it in his arms. The name of this brave engineer is Charles N. Thompson, and he is a native of Taunton, Mass.

JUST AS THE TWIG IS BENT.-Lord Shaftesbury recently declared at a public meeting, as an ascertalned fact, that forty-nine out of fifty of all the criminals in England, convicted in after-life, commenced their career of crime between the ages of eight and sixteen; so that he who has passed through his sixteenth year, without having begun a life of crime against the laws of his country in some particular or other, is almost certain never to do so. But the statistics may be somewhat different in America.

THE custom-house officers of San Francisco have discovered a very ingenious Chinese trick, which led to the seizure of a lot of smuggled opium. Among a cargo were 400 tubs invoiced as eggs, value stated at one dollar each. The eggs were coated with a peculiar kind of varnish to preserve them. One of the officers, in examining the eggs, scraped off a little varnish and disclosed a metallic case, egg-shaped, filled with opium. Each metallic egg is worth \$300. There was a thousand of them.

THE town of Wilna is to be lighted with gas from pine-wood. The basins will contain 60,000 cubic feet of water. The gasometer, of cast-iron, will be of the same capacity. The plan exhibits three distinct edifices for the distillation of gas, its purifications, and distribution. Forty-nine towns in Germany, Hungary, Italy, and Switzerland, and quite lately Helsingfors, owe their lighting to gas distilled from wood or jutesal.

LIVE AND DEAD WEIGHT OF SHEEP .- The English rule is to weigh sheep when fatted and divide the weight by 7 and call it quarters. Thus a sheep weighing 140 pounds, would give 20 pounds a quarter as dead weight. If the sheep are in good condition this rule is sufficiently accurate for all purposes. Poor sheep will fall below the mark, and extra fat ones go over it.

A MECHANICAL NOVELTY .- Mr. Barnum has recently added a mechanical novelty to his Museum, which consists of a case 4 feet 6 inces high, 3 feet wide, and 2 feet thick, which contains two hundred varieties of elaborate, full-sized, strong, and useful pieces of furniture of various kinds, all compactly stowed away.

A SUBSTANTIAL REWARD.—It is stated that by naval laws, when an inferior vessel sinks a superior one, her entire value goes to the victors. The Alabama being estimated to be worth \$500,000, Capt. Winslow will be entitled to from \$70,000 to \$100,000, while the seamen will get from \$1,200 to \$1,500