

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

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

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.

Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

See Prospectus on last page. No Traveling Agents employed.

VOL. II., NO. 12.....[NEW SERIES.]....Fifteenth Year.

NEW YORK, SATURDAY, MARCH 17, 1860.

AGRICULTURAL SCIENCE AND MACHINES.



OUR people seem to be devoting attention to agricultural science with a fervor which augurs well for its future growth and progress. Every State, we believe, has now its agricultural society; and there are county and town farmers' clubs almost innumerable. In addition to these, there is a United States Central Association, numerous agricultural periodicals and farm schools; and perhaps a higher influence, in some respects, than all of these, are the chairs of agricultural chemistry which have lately been established in some of the old colleges. These great and manifold agencies for increasing and spreading information on agricultural subjects ought to yield good fruits and bring forth abundant harvests. One of the best evidences of the desire now felt for the acquisition of agricultural science is the series of popular lectures which were recently given at Yale College by eminent practical and scientific agriculturists and horticulturists, who had been invited for the purpose from every section of the country. These lecturers detailed the results of their experience, and the methods which they practiced; and they expressed their opinions as to the best modes of cultivation and the most suitable fruits and grains for different soils and climates. This was teaching science in the very highest sense.

The questions naturally arise: why is there such an ado made about improved agriculture now-a-days? Do we not feed ourselves, and also supply other countries with large quantities of provisions, and are these not evidences of the prosperous condition of agriculture among us, and the high state to which the science and art have been carried by our farmers? To these, we answer: this subject is of vast importance to our people, because two-thirds of our population are engaged in, or connected in some manner with, agriculture; it is the greatest interest of our country, and ought always to engage the most attention. Another reason why this should excite them in more than an ordinary manner at present, is the fact that in most of the older cultivated districts the crops have decreased, both in quality and quantity. This has caused alarm, and it accounts for the activity among our people to retrieve evils which had been inflicted upon the soil by former unwise and unscientific farming. There are many extensive tracts of country, where wheat was once cultivated with great success and profit, where not an acre of it is now grown; and this is the case with some fruits, also, such as the peach and plum, which are now aliens to the same lands on which they once flourished. It has been proved that, in proportion to the extent of soil cultivated, there has been a decadence of the agricultural products of our country, and this has been caused by improper cultivation and exhaustion of the soil. The fact was formerly not duly appreciated, that the grain, fruits, hay, butter, beef and pork raised on farms, and sold to consumers, represented so much of the fertile soil itself, and that every bushel of wheat or other crop taken from it required to be returned again in some form as constituents, under the penalty of future barrenness. This fact is now universally recognized, and it forms the very foundation stone of agricultural science. Old farms, under proper cultivation, can be made to yield larger crops than new farms; but the best methods of enabling them to do so can only be acquired by experience. The whole science and art of agriculture may be summed up in a

few words; it consists in the practice of the most successful farmers; this is the only sure guide for others to follow. Many persons seem to consider "agricultural science" in the light of an abstraction; something exceedingly subtle and vague, which can only be learned in colleges. But we assure them it is something exceedingly practical; it means nothing more than farming conducted in the best and most systematic manner.

At this season of the year, we call the attention of our farmers to these, the leading ideas which should govern in agriculture. In the mechanical department of farming, it is a gratifying fact that our country is unrivaled; thanks to our inventors, and the encouragement given to them by the protection of patents. No farmer can really be successful unless he employs the most improved labor-saving implements and machines; and to us it is a most certain sign of success and progress to witness the alacrity of our farmers in adopting the most recently patented and improved machinery. Among the most valuable patents issued are those for agricultural implements; they meet with ready sales, and are justly remunerative. Every farmer should commence the season's operations with the best implements he can obtain; they will yield profitable returns for their cost before the year is closed.

TRADE STRIKES.

It is a blot upon modern civilization that the war of trades and classes is still waged as fiercely as of yore. Mutual good will should exist, and a fair understanding should always reign among employers and their workmen. The question of industry should be viewed in a broad light, unbroken by selfish individual interests; because, in reality, the interests of employers and employed are one. How very seldom—almost never—do we find these parties feeling and acting right towards one another. They seem to act as if their welfare and prosperity consisted in looking out for their individual interests, even to the injury of one another. They act upon purely selfish motives; and this being the case, frequent outbursts like that which took place in London among the builders, last year, and the strike now going on among the shoemakers of Marblehead and Lynn, Mass., may be expected—it cannot be otherwise. The last-mentioned strike is for a rise of wages among the shoe operatives of all classes—male and female. From published statements, it is evident that their wages have been very low, and we would be glad to see them greatly elevated. If it is possible to do this, it would be better for both operatives and manufacturers; but here comes the practical question upon which it is very difficult to pass judgment. It is said that the wages of the shoemakers have been reduced by manufacturers endeavoring to undersell one another, and that they have gradually reduced the prices of labor in order to sell low in the market. If this is so, we must say that the manufacturers did wrong, both for their own interests and those of their workmen. On the other hand, if, as some others have stated, the manufacturers have large stocks of goods on hand and cannot get paying prices for them, they cannot give prices that will cause loss on stock and capital. The question of "labor and demand" is one which operates by natural laws, and cannot be over-ruled by manufacturers or their workmen.

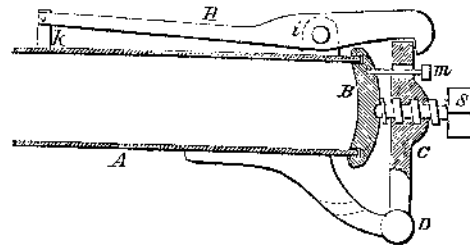
Trade strikes are usually impolitic, and end in the defeat of the operatives. They depend for their daily bread upon their wages, and when they cease laboring penury follows. But no matter which party is successful, the dregs of a strike are sour and bitter to both; because a spirit of mutual ill-will is usually engendered, and this is seldom, if ever, entirely removed. This being the case we deprecate all trade strikes, and would rejoice to see "courts of conciliation" established in the manufacturing districts to settle all "industrial disputes."

A SINGULAR ACCIDENT.

On Saturday, March 3d, a most singular casualty occurred at Elizabethport, N. J., which resulted in the very wonderful escape of Mr. George Gee, and in the death of Mr. Wm. Allen, brother of Mr. Horatio Allen, of the Novelty Works. It was the premature discharge of an apparatus for separating the fiber of wood for making paper and other fabrics, which was patented by A. S. Lyman, of this city, Aug. 3, 1858, and which is now attracting a great deal of attention.

It is well known that wood is composed of an immense number of minute tubes, arranged in a position parallel

with the grain. Mr. Lyman's plan consists in filling in these tubes with steam or water under a high pressure a close vessel, and then suddenly ejecting the wood into the open air, when the pressure of the steam, being no longer counterbalanced by the pressure external to the wood, bursts the fibers asunder. A tight and strong



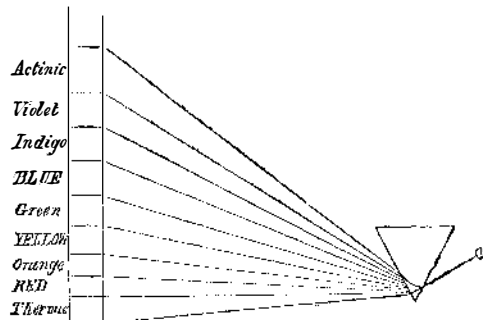
iron cylinder, A, in the annexed cut, 7 inches in diameter and 20 to 25 feet long, is prepared with one end permanently closed and the other covered with a movable valve, B, held in place by a latch, H. The wood is placed in this cylinder (or gun) and subjected to a pressure of steam of 180 lbs. to the inch for a sufficient length of time to heat the wood through to a temperature corresponding with this pressure, when the valve, being released from the hold of the latch, is blown off, and the wood is shot out into the open air. The steam in the tubes, being no longer confined by external pressure, expands and tears the fibers asunder. The lever, C, is provided with the screw, S, for adjusting the pressure of the valve to the end of the cylinder.

On the day mentioned, Mr. Gee had loaded the gun, and on shutting down the cap, perceived that the steam escaped. As he was endeavoring to ascertain where the breakage was, Mr. Allen came up behind him and wished him good morning. Mr. Gee turned around, and just as Mr. Allen stepped in front of the gun, it exploded prematurely, the steam and fibrous wood striking him with such violence that his body was thrown several yards. He was, of course, instantly killed. Mr. Gee escaped without the least wound or injury. The body of Mr. Allen was brought to this city by a steam-tug on Sunday morning, and was landed at the Novelty Works, whence it was conveyed to the late residence of the deceased.

THE PHILOSOPHY OF THE PHOTOGRAPH.

We have made a practice of mentioning the great discoveries which have, from time to time, been made in the art of sun painting; and finding so many photographers among our subscribers, as well as such wide spread interest in the subject, we design to hereafter make a fuller record of the numerous small improvements which are constantly being made in this most delicate and beautiful art. In order to render this department of our paper interesting to as large a portion as possible of our readers, we wish to make the accounts of these improvements intelligible to all; we therefore introduce them with a brief explanation of the principles of photography, which, it will be understood, is not intended for those who have thoroughly investigated the subject, but for those who have not.

The lights and shades in daguerreotype and photographic pictures are the result of chemical changes wrought in various substances by the action, not strictly speaking of light, but of an element in the sun's rays which is not perceptible by the eye, and which is therefore an element distinct from that light. When a pencil of the sun's



rays is admitted through a small hole in the shutter of a darkened room and allowed to pass through a triangular prism of glass, the ray is bent from its straight path and produces an image upon the wall, of varied and most exquisitely delicate colors. Sir Isaac Newton, who first made this experiment, pronounced these colors to be seven in number, the ray which is the least bent being