

SCIENTIFIC MUSEUM.

Velocity.

Velocity, in dynamics, is the ratio of the quantity of linear extension that has been passed over in a certain portion of time; or it is the ratio of the time that has been employed in moving along a determinate extension.

When a man ascends vertically, his velocity is reduced to about one half of his horizontal velocity, indicating that he acts against a double resistance; therefore, when a man ascending a ladder, carries a load, the maximum effect will take place when his ascending velocity is about one fourth of the velocity he can walk horizontally without a load.

A man of ordinary strength will not be able to walk, unloaded, at a quicker rate than $3\frac{1}{2}$ miles an hour, if this exertion is to be continued for 10 hours every day. Indeed, those who examine the subject with a view to a fair average, will find this to be about the extreme velocity that can be continued, without injury, for any considerable time; therefore a man ought to move with half this velocity to produce a maximum effect; that is, at the rate of $1\frac{3}{4}$ miles an hour, which is about $2\frac{1}{4}$ feet per second.

But this supposes the load to be the useful effect, whereas part of it must consist of the apparatus employed to carry it, or the friction of the intermediate machine, or other circumstances of a like nature. About one-fifth of the velocity may be considered equivalent, at an average, to the force lost in friction, &c., in all cases; in many it will exceed one-fifth. Hence the maximum of useful effect will take place when the velocity is 2 feet per second, or about 11 furlongs an hour continued for 10 hours each day.

Smeaton is said to have made numerous comparisons, from which he concluded that the mechanical power of a man is equivalent to 3,750 lbs. moving at the velocity of one foot per minute; and taking this average to be near the true one, as there is reason to conclude it is, we have

$$\frac{3750}{2 \times 60} = 31.25 \text{ lbs.}$$

Therefore, we make the average mechanical power of a man 31.25 lbs. moving at the velocity of 2 feet per second, when the useful effect is the greatest possible; or half a cubic foot of water raised two feet per second; a very convenient expression for hydrodynamical inquiries.

If a man ascend a vertical ladder, according to a preceding remark, the velocity which corresponds to the maximum of useful effect will be 1 foot per second, and the load double that which he carries horizontally; consequently the average of useful effect is 62.5 lbs. raised one foot per second.

Masons' laborers ascend ladders with a load of about 80 lbs. besides the hod; sometimes at the rate of one foot per second, but more frequently about 9 inches per second.

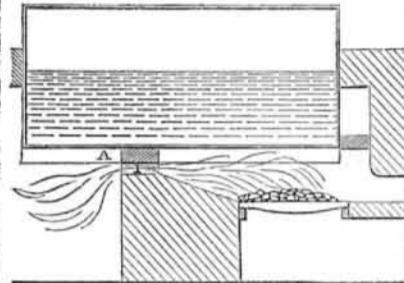
Ascending stairs is more trying to the muscles of the legs than ascending a ladder; and therefore the useful effect is less, till a person has become accustomed to this kind of labor; and it is also to be observed that the space moved over is increased, unnecessarily, except where the horizontal distance is part of the path over which the load is to be moved.

The force of a horse is, at an average, about equal to that of six men, according to various estimates; and the rate of travelling about the same, perhaps rather less than that of a man, when his exertion is continued for 8 hours; consequently the velocity corresponding to the maximum effect will be about $2\frac{1}{2}$ feet per second. Whence, the average mechanical power of a horse may be estimated at $187\frac{1}{2}$ lbs. moving with a velocity of $2\frac{1}{2}$ feet per second, or 3 cubic feet of water raised $2\frac{1}{2}$ feet per second; the day's work being 8 hours.

Interesting to Scientific Authors.

A very interesting scientific case was recently tried before the U. S. Circuit Court, at Boston. It appears that during the summer of 1848, an arrangement was entered into between Edward Desor, of Neufchatel, a geologist, and Lieut. C. H. Davis, of Cambridge, to produce a joint work on the geological effects of the tidal currents of the ocean.—Lieut. Davis afterwards declined to proceed

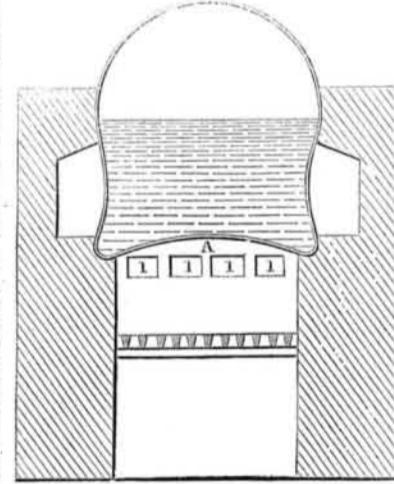
in the new enterprise; hence an action to recover the value of labor and time devoted to the work was instituted by M. Desor, and the amount claimed was \$2,000. The defence set up was, there was one contract between the parties to prosecute the undertaking, but their association was merely for mutual scientific investigation. The plaintiff produced witnesses and an outline of the contents of one of the works in the defendant's handwriting to show that he was for a period of several months busily and devotedly prosecuting his investigations, the results of which would probably be lost to him by the cessation of the joint enterprise. A verdict was rendered for plaintiff of \$1,000.

On Boilers.—No. 8.
FIG. 16.

PROSSER'S SMOKE BURNER.—The accompanying engravings represent an improvement in furnaces, by Mr. R. Prosser, of Birmingham, England, patented in 1839.

Fig. 16 is a section lengthwise; the letter, A, indicating a wall of fire bricks in contact with the bottom of the boiler. This wall has apertures, 1 1, through which the gases of combustion must pass on their way to the chimney. The number and size of these apertures are varied to suit large or small boilers. Fig. 17 is a cross section, showing the wall, A, and the apertures through which the gases pass on their way to the chimney. It will be noticed that instead of the ordinary bridge. Mr. Prosser places the bridge at a distance from the ends of the fire-bars and close against the bottom of the boiler. The gases thus prevented from passing along the boiler in the ordinary way, are carried through flues or openings in the bridge to a chamber beyond the bridge, and thence to the chimney. The space between the end of the fire-bars and the

FIG. 17.



bridge, is of fire brick forming an inclined plane, upon which the red hot fuel is intended to be pushed, so as to keep these bricks heated, for the purpose of effecting the combustion of the gases of the coal. The economy of fuel, as stated by the inventor to have resulted from the improvement, is 23 per cent., said to have arisen from exposing so large a portion of the boiler bottom to the direct action of the radiant heat from the red-hot fuel.

Water Melon Butter.

A correspondent of the Prairie Farmer, presents the following method of using watermelons:—

I endeavor every year to raise a good water-melon patch. They are a healthy and delightful fruit, I think. I cultivate the ice rind variety; plant early in May, and again towards the close of the month, so that they may come in succession. When they commence ripening we commence eating, and use them freely during the hot weather. When the weather becomes cool in September, we haul a quantity of them to the house, split

them open with a spoon, scrape out the pulps into a cullender, and strain the water into vessels. We boil it in iron vessels down to syrup, then put in apples or peaches, like making apple butter, and boil slowly, until the fruit is well cooked, then spice to taste, and you have something that most of people will prefer to apple butter, or any kind of preserves. Or the syrup may be boiled without fruit, down to molasses, which will be found to be as fine as the best sugar house molasses. We have made of a fall as much as ten gallons of the apple butter, if I may so call it, and molasses, which has kept until May in fine condition.

Liability of Telegraphs.

A case of Edward Shields, vs. the Washington and New Orleans Telegraph Co., was recently tried at New Orleans, and which determined several points of interest which should be known by every person in our country.

The plaintiff sued for \$164 damages, arising from the incorrect transmission of a telegraphic dispatch, in which the word sixty-six was substituted in the price of oats for fifty-six, the correct number. The company refunded the cost of the despatch, but resisted any liability incurred by the mistake of the operator. As this is the first case of the kind tried, the principles laid down by the court are very interesting and important, as governing other cases. Judge Buchanan charged directly against any liability incurred by the company, for mistakes of this kind; because uncontrollable influences from atmospheric causes are likely to derange the wires and pervert a telegraphic message. It is unreasonable to apply the doctrine which applies to common carriers to a case like the present. The carrier is responsible for the merchandise entrusted to his care; but that merchandise has an appreciable value. The Judge says:—

What, on the contrary, is the test of appreciation of a despatch like that which the plaintiff received in this instance from his correspondent? The despatch read or said, oats fifty-six, bran one-ten, corn seventy-three, hay twenty-five. The person who sent the despatch made no explanation to the operator, and without explanation how could the operator know whether the numbers in question referred to dollars and cents or to bushels and bales? Again, how could the operator know whether the said despatch conveyed an order to purchase or an account of sales? and if he were bound to infer the former, what information did the despatch convey to his mind of the extent of the order? The meaning of the despatch was a secret to all but the parties corresponding. Under these circumstances the value of the message transmitted was inappreciable, and this telegraph company had no means of knowing the extent of the responsibility which ought to be involved in its correct transmission, upon the principles contended for by the counsel for the plaintiff.

The judgment was for plaintiff to the amount of three dollars and fifty cents—the cost of the message—which the company had offered to refund, and the costs of the court.

Great Artist Dead.

Turner, the great English painter, is dead. He was called the Claude Lorraine of Britain. He was at the very head of his profession, and arose, as all artists must do by the dint of genius. His father was poor, and he was more indebted to him for an exact than a liberal education. He is the painter so highly eulogized by Ruskin, the celebrated author.

LITERARY NOTICES.

THE MODEL COURIER.—By Andrew McMakin, Philadelphia, is too well known to require eulogy from our pen; it is one of the best literary journals published in America, and is widely circulated. The editors and contributors rank among the ablest in our country. Terms \$2.

BOSTON MUSEUM.—Edited and published by C. A. V. Putnam & Co., Boston, has just commenced a new volume, much improved in appearance. The Museum is a well-conducted journal, and deserves a large patronage. It circulates extensively, and is an excellent family journal. Terms \$2.

Among the many excellent Agricultural journals published in the United States, we recommend "The Boston (Mass.) Cultivator," weekly—\$2; "Rural New Yorker," weekly—\$2, Rochester, N. Y.; "American Farmer," monthly, Baltimore, Maryland—\$1; "Southern Cultivator," monthly, Macon, Geo.—\$1; "Prairie Farmer," monthly, Chicago, Ill.—\$1; "Ohio Cultivator," monthly, Columbus, Ohio—\$1; "Genesee Farmer," Rochester, N. Y., 50 cents.

THE SCIENTIFIC AMERICAN
To its Friends and the Public.

Commencing a new year, we take the opportunity to express our grateful acknowledgments to the patrons of the Scientific American for the deep interest manifested in its success. We aim to furnish a journal not only popular, but eminently practical in the several departments of Chemistry, Mechanics, Engineering, and Manufacturing. Without employing the ordinary appliances, such as local and general canvassers, we have mainly depended upon voluntary subscriptions, allowing the character of the journal to find its way to the regard of individuals. Our general expectations have not been disappointed, for out of the large list of cash-paying subscribers, whose names are familiar to us from a long association, we recognize many active energetic friends, whose influence we yearly profit by.

We are grateful for all favors, and as our success is centred in the support of that valuable class whose labors are not only enriching and adorning, but elevating the character of our country, we must still claim their active and co-operative sympathy. For the small sum of two dollars we are furnishing an Encyclopedia of the Arts and Sciences, covering over 400 pages, richly illustrating the progress of invention and discovery throughout the world. Considering that this sum is one-fourth less than the cheapest English publication, it may not be necessary to state that a large subscription list is required to sustain it.

The fact of its success is no longer predicated upon doubt; but, that we may be enabled to carry out our future designs, an increased subscription list will be necessary. We anticipate, from the continued support of our friends, that we shall be able to advance the Scientific American, in point of circulation, to a position second to none in this country; and we promise a journal not inferior in its character, size, and ability to any other.

The views promulgated through its columns have received the approbation of the American press, and it is a source of gratification to us that it has gained, and still is gaining a strong foot-hold in Europe, and is quoted as the leading American Scientific Journal. A recent London paper says, "it is excelled by few periodicals," and proceeds to regret that the English tax upon literature does not permit so cheap and valuable a work to circulate within the reach of the laboring and producing classes, whereby they may become, not mere machines, but, like most of our American Mechanics, intelligent, influential citizens.

No land is so highly favored as our own in respect to educational privileges—none where all the appliances are so easily and cheaply obtained—a cheap press and a system of free education, are the elements which enter largely into our National character. A people to be free and happy must of necessity be intelligent. We should not esteem our blessings lightly, but strive to improve them. It is unquestionably true that men, practically scientific, are among the most useful class in community, and our greatness as much depends upon them as upon any other class. The statesman, the lawyer, the minister, and the farmer, have each their appropriate work, but in the great scheme of internal improvement, the mechanic, the man of science, is wanted.

We offer these suggestions as entirely relevant to our present subject, and urge our mechanics to become readers; and, if consistent with their feelings, subscribers to the Scientific American, for we feel assured that in fifty-two numbers they will find information worth to them infinitely more than the amount paid for it. It is difficult to maintain a good Scientific Journal at so small a price, as many can sorely testify from experience; and had we not a clear field at the commencement, and a tolerable capital, the Scientific American would not now enjoy its present position.

Through our extensive facilities as American and Foreign Patent Agents, we are enabled to furnish our columns with a most complete summary of all the new improvements; and having agents located in London and Paris, we are early notified of changes in Foreign Patent Laws affecting inventors' interests. We hope to improve the value of the Scientific American by constant and unremitting care, and to secure a continued and increasing patronage from the public.

We hope our friends are not forgetting to exercise their usual kind offices, but are continuing to recommend their neighbors to subscribe and to form clubs for the new year.

Postmasters, being authorized agents for the Scientific American, will very generally attend to forwarding letters covering remittances.

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Ten Copies for Twelve Months,	15
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N. B.—The public are particularly warned against paying money to Travelling Agents, as none are accredited from this office. The only safe way to obtain a paper is to remit to the publishers.