Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

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NEW YORK, SATURDAY, NOVEMBER 14, 1885.

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(Illustrated articles are marked with an asterisk.)

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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 515,

For the Week Ending November 14, 1885.

Price 10 cents. For sale by all newsdealers.

THE WASTE OF WHISTLING.

The nuisance of the steam whistle in populated neighborhoods has been frequently mentioned, and in some localities municipal ordinances and railroad managements have restricted its use. But it is seldom that the cost, expense, and waste of the steam whistle is mentioned. And yet the blowing off of steam through locomotive whistles alone must entail an enormous waste of fuel. Steamboat whistles and the utterly useless stationary engine whistles must make, in the aggregate, an enormous waste to the purchasers of fuel for steam boilers. From recent reports it is seen that there are 1,940 grade crossings in the two States of New Hampshire and Connecticut. Probably not less than an average of twelve trains cross these roads daily; at each a locomotive whistles under a pressure of about 110 to 120 pounds the square inch. The aggregate amount of steam thus blown off into noise is very great.

The steam from a whistle escapes in an annular space around the bowl; and if the whistle is six inches diameter and the annular space is only one thirty-second of an inch wide, the total escaping space will be more than one-half square inch. That much steam is required to supply a steam whistle is evident from the fact that all steam whistles have for their connecting stems very generous steam pipes; and also from the fact, patent to every observer, that as dense a cloud of vapor is formed from the steam of the whistle as that escaping from the safety valve in the same time.

The superintendent of one of the most important railroads in the country, himself a practical engine driver, says that when he was a locomotive engineer he was requested by a committee of local political demonstration to persistently toot his whistle as he approached the depot from a point nearly a mile from the station. He did so, and ran his steam down so that his passengers had either to walk from the stationary train or wait until steam could be gotten up. The writer once in whistling two refractory oxen off his road ran his steam down from 110 to 80 within less than two minutes, and the fireman piling in the wood all the time. The superintendent to whom reference has been made believes that for the time the ordinary steam whistle is used, more steam is required than is used for driving the locomotive, with its double cylinders and pulling a train of cars. The whistle demand of steam is a constant one during its use—not intermittent like the admission of steam to an engine cylinder; and the size of the pipe—not less than one and a half inches—permits a very large amount of steam to escape under a pressure of 120 pounds to the square inch. This authority, with others of practical knowledge, says that thirty-five cents per day for the tooting of steam whistles on running trains is a very low estimate of the cost. This does not include depot yard work. And no estimation is conjectured as to the waste of steam and cost of fuel for the steamboat and steam tug whistles and those of stationary boilers. But for exactive legal enactment and obstructive legalized orders, much of the useless waste of whistling, and much of its abominable annoyance, could be stopped and abated.

A still more exact statement is that of a well informed railroad man, who says that the expenditure of fuel for each locomotive on the New York, New Haven, and Hartford road each day is about one-eighth of a ton; this only for the legally required soundings at grade crossings. This would make, for this one road, the cost of fuel, for grade crossing steam whistling alone, not less than $15,000 per year.

ASTRONOMICAL NOTES.

THE GREAT RUSSIAN TELESCOPE

is now in successful working order in the Observatory at Pulkowa. Herr Struve, the Director of the Observatory, was present at the eleventh meeting of the Astronomical Association, which was held at Geneva in the month of August. The distinguished astronomer bore testimony to his complete satisfaction with the working of the new telescope. He presented to the members of the Association photographs of the great refractor.

Professor Newcomb, of Washington, was also present at the meeting. He had been at Pulkowa, studied the instrument thoroughly for seven days continuously, and indorsed heartily Herr Struve's views regarding it, giving at the same time various interesting details. It is to be hoped that the telescope in the hands of so efficient a director will distinguish itself by making some brilliant discovery. It is at present the largest refractor in the world, the object glass being thirty inches in diameter.

The glass was prepared by Messrs. Alvan Clark & Sons, of Cambridgeport. Mr. Alvan Clark has received from the Czar of Russia gratifying proof of the appreciation of his work: It took form in the golden honorary medal of the empire "in acknowledgment of the excellent performances of the great object glass." The medal is given very rarely, and only for extraordinary merits. Only one other has been granted by the present Emperor.

THE AUGUST METEORS.

Mr. Denning, of Bristol, England, reports that the shower was more brilliant than usual, although he made no regular observations, on account of the overcast sky. Many meteors were, however, noticed in the clear spaces that occasionally occurred, and the display must have been a fine one, judging from the numbers visible in the small portion of the heavens available for observation. The August meteors are known as Perseids, because they radiate from a point in the constellation Perseus. On the nights of August 5, 8, and 13, thirty-seven Perseids were seen, though cloudy weather prevented a full observation. The shower continued until the 20th, though it was a very slight shower at the last, two Perseids only being seen in a watch of three hours and a half, when thirty-one meteors were recorded.

A REMARKABLE SOLAR PROTUBERANCE.

We find in "Ciel et Terre" an interesting account of a very brilliant solar protuberance, observed by M. Trouvelot, on the 16th of August, on the sun's eastern border. At first it appeared to be detached from the sun, and seemed to float above the solar surface like clouds in our atmosphere. Closer attention showed that such was not the case, but that it was attached to the chromosphere by a long and slender filament, inclined, and slightly luminous. The protuberance seemed to be composed of a single branching filament folded or rolled several times upon itself, thus forming a compact mass of a hemispherical form. The lower part extended 2′ 36″ from the sun, and the summit reached a height of 3′ 54″. An hour later, the protuberance, at first quiescent, showed signs of movement. It became dazzlingly bright, rising gradually above the sun until it attained a height of 4′ 51″. A curious phenomenon occurred during its ascent. As it rose it seemed to unroll, the principal mass appearing to unwind, and the branches first seen remaining easily recognized on the column, in spite of the changes of form it had undergone.

Half an hour later, it formed a long, branching column, brighter at the summit than at the base. As it rose, its luster dimmed. This is usually the case with protuberances that rise above the sun. At the end of the observation it was so faint that the summit alone was visible. A faint idea may thus be gained of the pent-up forces existing in the solar mass, when eruptions of flaming hydrogen take place like the one described. The tongues of flame must have reached a height of nearly 130,000 miles above the solar surface, moving with an amazing velocity, changing form with incredible rapidity, and beginning and ending during an observation of about two hours.

ASTEROIDS.

We have already recorded the advent of five asteroids in 1885, the last ranking as No. 249. Three new ones have since been added to the list. Dr. Palisa, of Vienna, won the honor of discovering No. 250 on the 4th of September. Dr. Palisa also discovered No. 251 on the 4th of October, thus raising the number of those found by him to forty-nine. Dr. Perrotin is latest in the field, announcing the discovery of No. 252 on the 28th of October. Thus far the three latest comers remain unnamed. It is becoming difficult to find names for this numerous family.

Percentage.

The reckoning of percentages, like the minus sign in algebra, is a constant stumbling block to the novice. Even experienced newspaper writers often become muddled when they attempt to speak of it. The ascending scale is easy enough: Five added to twenty is a gain of 25 per cent; given any sum of figures, the doubling of it is an addition of 100 per cent. But the moment the change is a decreasing calculation, the inexperienced mathematician betrays himself, and even the expert is apt to stumble or go astray. An advance from twenty to twenty-five is an increase of 25 per cent; but the reverse of this, that is, a decline from twenty-five to twenty, is a decrease of only 20 per cent. There are many persons, otherwise intelligent, who cannot see why the reduction of one hundred to fifty is not a decrease of 100 per cent, if an advance from fifty to one hundred is an increase of 100 per cent. The other day an article of merchandise which had been purchased at ten cents a pound was resold at thirty cents a pound, a profit of 200 per cent; whereupon a writer, in chronicling the sale, said that at the beginning of the recent depression several invoices of the same class of goods, which had cost over thirty cents per pound, had been finally sold at ten cents per pound, a loss of over 200 per cent. Of course there cannot be a decrease or loss of more than 100 per cent, because this wipes out the whole of the investment. An advance from ten to thirty is a gain of 200 per cent; a decline from thirty to ten is a loss of only 66 2-3 per cent. The New York *Sun* prides itself on the exactness and purity of its style, and indulges in frequent criticisms of its contemporaries; but in its Thursday morning's description of the great orchid sale, it affirms that "some of the highest priced plants brought 150 per cent less than Mrs. Morgan paid for them." Of course, if nothing was realized from them, this would only be 100 per cent less than they cost.—*Journal of Commerce.*