

Scientific American.

MUNN & CO., Editors and Proprietors.

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

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

The American News Co., Agents, 121 Nassau street, New York. The New York News Co., 8 Spruce street, New York. A. Asher & Co., 20 Unter den Linden, Berlin, Prussia, are Agents for the German States. Messrs. Sampson Low, Son & Marston, Crown Building, 25 Fleet street, Trubner & Co., 60 Paternoster Row, and Gordon & Gotch, 121 Holborn Hill, London, are the Agents to receive European subscriptions. Orders sent to them will be promptly attended to.

VOL. XXV., NO. 18. [NEW SERIES.] . . Twenty-sixth Year.

NEW YORK, SATURDAY, OCTOBER 28, 1871.

Contents:

(Illustrated articles are marked with an asterisk.)

A Gigantic Railway Project... 279
Another Side of the Tobacco Question... 273
Answers to Correspondents... 281
Applications for the Extension of Patents... 283
Austrian International Exhibition... 277
Boiler Incrustation... 271
Business and Personal... 281
Cast Iron Railroads... 276
Comets... 279
Crocker's Improved Strap Cutter... 274
Declined... 281
Dunbar's Improved Horse Collar... 274
Edgerton's Improved Gas Retorts... 273
Electricity in Medicine... 280
English Gunnery Experiments... 273
Facts about Ropes... 275
Fairlie's Improvement in Locomotive Engines... 277
Fair of the American Institute... 280
Fast Railroad Time... 276
Filters and Filtering... 275
Filtration in Refineries, etc... 275
Fireproof Building... 279
Fireproof Safes - Improvement Wanted... 281
Forty Years in the Grave... 275
Genius and Common Sense... 278
Gunpowder... 274
Harcourt's Researches on Glass... 272
Herr's Paper File... 278
Horse Shoeing... 272
Ice Fleas... 272
Improved Panel Raising Machine... 278
Incautious Advice Regarding Steam Boilers... 276
Incongruous Metal Work... 277
Inventions Patented in England by Americans... 284
Iodized Milk... 281
Iron Trade in Great Britain... 277
Lowe's Bucket Elevator... 275
Musical Dancing Toy... 278
Natural Rights of Inventors... 271
Nickel Plating... 278
Official List of Patents... 283
Paper making in Japan... 273
Proposed Monument in Athens to Comemorate Greek Independence... 271
Psychic Force... 276
Queries... 282
Recent American and Foreign Patents... 282
Ruge's Lamp Extinguisher... 277
Scientific Intelligence... 280
Smoke and Dust Deflector... 273
Surface Blow for Steam Boilers... 277
The American Safety Student Lamp... 274
The Best Engineering... 275
The Blue Grass Region of Kentucky... 273
The Great Fires in the Northwest... 279
The New Jersey Zinc Company... 279
The St. Gothard Railway... 277
The Resurrection of Chicago... 276
The Rolling of Gunboats... 278
To find the contents of Pyramids of Balls... 276
Yielding's Improvement in Manufacture of Steel Castings, etc... 274

FIREPROOF BUILDING.

The Chicago fire has proved that so called fireproof building may retard the progress of a great fire, but cannot prevent its onward march, when once it has gathered sufficient power in the destruction of wooden buildings. In a city built wholly of brick, stone, and iron, no such fire would have been possible.

A single isolated block of fireproof buildings is no more secure when surrounded by wooden structures than is a so called burglar-proof safe when burglars have ample time and means to open it.

While this does not demonstrate the uselessness of making buildings in cities as nearly fireproof as possible, it shows the necessity of enforcing a better style of building than is allowed in many of the young cities on this continent.

The power of concentrated heat upon stone, bricks, and iron is little appreciated by those who rely upon these materials as security from burning. The writer was in the city of Troy at the great fire of 1862, and had an opportunity of witnessing the effect of fire upon several supposed fireproof buildings, which stood in the direct line of the advancing flames. The heat was blown upon these buildings with almost the intensity of a blast furnace. The wrought iron shutters, which were depended upon to protect the windows, curled up and warped, exposing the glass beneath, which soon broke or melted, or if supported by wooden sashes, was almost instantly dropped from the frames. Then the flames found admission to the buildings, which soon yielded.

It was noticed particularly that cast iron actually seemed to burn, and we have little doubt that in many cases there was actual burning of the metal; the same effect being produced as would be upon the bottoms of cast iron kettles placed over fire and containing hot sand. Nearly every one knows that when cast iron is raised to a red heat, it speedily oxidizes or burns. The extensive use of this material is therefore not the best practice in rendering buildings fire-proof.

In the Troy fire, it was seen that even the supposed fireproof safes burned in most cases when they were not protected by masonry. At the great fire at London Bridge, which took place in the summer of 1861, the ready yielding of cast iron columns, beams, and girders was specially noticed, and formed the subject of an article in the London Review.

The fact is, that cast iron is no more to be depended on than wood when standing amidst a really great fire. Wrought iron does better, but it too has important defects, among which is its expansibility under heat, which, when it is used in conjunction with masonry, cracks the latter, and thus commences the work of destruction.

In short, our present systems of fireproofing need thorough revision and modification, in the light of recent experience, before they can deserve the confidence of the public.

A GIGANTIC RAILWAY PROJECT.

At present the shortest line of travel for passengers between England and India is by way of Brindisi, Alexandria and Suez, to Kurrachee or Bombay, requiring twenty days for its accomplishment. To reduce the time from England to India, to a little more than five days, is the proposition of Messrs William Low and George Thomas, who, in a communication

to Mr. Gladstone, have set forth a scheme, the leading features of which are as follows:

First, to use existing lines of railway and the Mont Cenis Tunnel to Trieste, and thence to construct a railway through Austria, European and Asiatic Turkey, Persia, and Beloochistan, to Kurrachee and to Bombay.

The route proposed is as follows; From Trieste, by Fiume to the eastern shore of the Adriatic Sea, thence southwards to a point nearly opposite Brindisi; thence eastward, across Turkey, north of the Archipelago and the Sea of Marmora, to Constantinople; thence crossing the Bosphorus and turning southward at Scutari, reaching the Mediterranean at Adalia, thence skirting the coast to Alexandretta; thence south-easterly to the west end of the Persian Gulf; thence following the shore of the Gulf and of the Arabian Sea to Kurrachee, and thence to Bombay.

The distance, including the Straits of Dover, is stated to be 5,339 miles. Allowing a speed of 40 miles per hour by land, and 10 1/2 miles per hour by water, the time that would be required for this journey would be 5 days, 16 hours, and 46 minutes. Estimating the rate of travel by land at 30 miles per hour, the time for the journey would be 7 days, 13 hours, and 22 minutes.

There are already 1,170 miles of this line now constructed, and it is estimated that the completion of the remainder would cost about \$205,000,000.

Messrs. Low and Thomas propose that the countries, through which the line would pass, shall share in the expense of construction.

Other financial features of their scheme are the formation of an Anglo-Indian Company, that shall construct and maintain the permanent way, and subordinate companies that shall construct and maintain stations, sidings, etc., for local traffic.

The projectors apprehend, very justly, we think, that the raising of the capital and the organization of companies would be the chief difficulty to be surmounted. Allowing a year's time for the preliminary business, they think the road might be completed and running within three years of the present time.

Were there not some precedent in the rapid completion of the Union Pacific Railway in this country, this scheme might be considered visionary and impracticable; but it has been demonstrated that the mere length of railways is a matter of small importance as affecting their speedy completion. The procurement of the necessary agreement on the part of the various governments, the territory of which it is proposed to traverse, is a work of greater magnitude than the building of the road itself; and, should the projectors succeed in accomplishing this, there may be some chance for the success of their project.

The rapid growth of the modern railway system is appreciated by very few, and the magnitude of some of the enterprises, now looked upon as feasible, is something that the last generation little dreamed of. Five thousand miles is a long distance, and two hundred millions of dollars quite a respectable sum of money, yet these things are talked about now-a-days without scarcely producing a sensation in the commercial world.

THE GREAT FIRES IN THE NORTHWEST.

For weeks past the papers have brought us accounts of fires raging in the woods and on the prairies of the Northwest. As such fires are almost of annual occurrence, these reports were received as somewhat sensational narratives of a series of not very extraordinary events; and, in the terrible news of the burning of Chicago, with the excitement ensuing, were almost overlooked.

Day by day, however, has the evidence accumulated that Michigan and Wisconsin are suffering to an unprecedented extent from these fires, that vast amounts of property were consumed, and many human lives destroyed, the whole disaster assuming proportions which far eclipse in extent the Chicago calamity, and which call for the most active sympathy and aid from humanity at large.

The timber which has been destroyed was alone worth more than the entire city of Chicago. It is estimated that not less than thirty thousand square miles of heavily timbered pine lands have been swept over by the flames. Thousands of farms with their stock have been destroyed, villages have been licked up by the hungry flames, and hundreds, perhaps thousands, of human lives lost.

This calamity following the great Chicago catastrophe, and the many minor accidents which have destroyed human life by wholesale, will render the present year memorable in the history of the country, as one of unprecedented disaster. Taking up our files and glancing over their contents, we shrink horror-struck from the fearful catalogue. Many of these destructive events might have been prevented by the exercise of proper care, but human watchfulness cannot control the elements.

For a long time, the region now suffering in the Northwest, has been parched with drouth, and becoming prepared for this terrible visitation. The fires must now have their own way, till natural causes extinguish them. How much farther they will ravage, or when they will terminate, cannot be predicted, although, in the ordinary course of things, the fall rains must, ere long, put an end to them. There yet remains time, however, for extended devastation, and we may expect, during the next fortnight, many additional details of the advance of the fire, the changing of fair and fruitful fields into deserts, and the flight of the houseless, homeless, and hopeless, in wild abandonment of purpose, for some indefinite shelter, perhaps to be overtaken by the pitiless flame on the desolate plains, or to find a grave in the bed of some unfordable stream.

Such has been the fate of many unfortunates, and thou-

sands who have escaped death are now totally destitute at a time when the approaching winter renders their situation terrible indeed.

Appeals are made for contributions of everything that can be directly or indirectly useful in ameliorating the condition of the sufferers. The noble generosity that has been displayed toward Chicago, will not, we are assured, pause in its benevolent work. The appeal from the Northwest will not be made in vain. In fact, it has been already responded to in many parts of the country, and there will be no dearth of contributions as soon as the proper channels, through which to send relief, are indicated.

From the tangled mass of the reports which crowd the daily journals, it is next to impossible to form an idea of the real extent of the loss of life and damage to property, but time will undoubtedly prove this to be the most destructive fire on record.

THE NEW JERSEY ZINC COMPANY.

In our notice of the Wetherill patent trial, October 14th, an injustice was unintentionally done to the above Company, which we hasten to correct. The statement that the aforesaid patent decision was likely to result in an extensive mulcting of the Company, and otherwise to affect its prosperity, is, we are happy to say, without foundation. The operations of the Company are not dependent on the use of the Wetherill patent, or any other one patent. It is true that a large proportion of all the zinc white sold in market is made by the New Jersey Zinc Company, that their article enjoys everywhere the highest reputation, and is always in demand on account of its superior quality. But this excellence is due to the splendid nature of the Company's ores, and the scientific care with which they are treated, by processes peculiarly their own. The mining properties, controlled by the Company, which yield these ores, and upon which, in connection with its large capital, the success of the Company is based, are extensive and valuable. Each year develops more and more their intrinsic worth.

The reported decline of the Company's stock is also a fiction. The stock is not sold in open market at all, but is held, in private hands, by parties who know all about the affairs and resources of the Company, and who are not likely to be influenced to sacrifice their interests by any mere newspaper paragraph. The officers of the Company are men of ability, and have the confidence of the stockholders.

COMETS.

The approach of Encke's comet to the field of our vision will give interest to a few remarks on these remarkable and eccentric bodies. Their extraordinary appearance caused them to be regarded in ancient times with superstitious terror, and as prognostications of war and other great disasters. Their ominous aspect is heightened by their visiting our part of the heavens from all directions, and crossing the usual west to east course of the planets at all possible angles. Moreover, the train of faint light which they leave behind them is a substance so extremely thin that the smallest stars may be seen through it; and it is so slightly ponderable that the proximity of a comet of 200,000,000 miles in length seldom disturbs the equilibrium of any body near which it may happen to pass.

But that it has weight we have evidence, for the velocity of comets diminishes, a fact which also determines that the ether of illimitable space is a resisting medium, sensible to a body of such inappreciable tenuity. However, the matter in a comet is so small in weight that the comet of 1770 was involved, as it were, among Jupiter's satellites for some months, without any disturbance of either to the slightest degree. The comet of the year 1770 is an exception to this rule. In that year it was seen to be moving in the usual elliptical orbit, having a period of 5 1/2 years. But on calculating its time, astronomers found that it had passed very near the planet Jupiter, the attraction of which immense body had disturbed its course to a remarkable degree, and this accounted for its being unrecognized by the scientific world, its period, previous to the perturbation, having been 48 years. It returned to the sun in 1776, but was not visible to us. Again in 1779, it was so attacked by the same planet that its orbit was changed into one of 16 years, with a perihelion, or nearest to the sun, distance of 300,000,000 miles; and it has never since come to our view. The period of revolution of Encke's comet has diminished, by about 3 days, in 80 years, that is, in about 25 revolutions.

The great discovery that led to a comprehension of the nature of the orbits of comets was made by Dr. Halley, that eminent astronomer asserting that the great comet of the year 1682 was identical with those of 1607, 1531, and 1456, and foretelling its reappearance in 1759. It was retarded, however, between one and two years, and reappeared in 1835. Its next visitation will be in the year 1912, or thereabouts. History mentions appearances of this comet as far back as the year 11 B. C.

There is little reason to doubt that the earth passed through the tail of the comet of 1861. Mr. J. R. Hind, the British Astronomer Royal, predicted that the transit would take place on Sunday, June 30, of that year, and Mr. Lowe, another English astronomer, reports that, on the evening of that day, "the sky had a yellow auroral, glare-like look; and the sun, though shining, gave but feeble light. The comet was plainly visible at 7:45 P. M., during sunshine, while on subsequent evenings it was not seen till an hour later. In the parish church, the vicar had the pulpit candles lighted at 7 o'clock, which proves that a sensation of darkness was felt even while the sun was shining. The comet itself had a much more hazy appearance than at any time after that evening."