

and Herbemont) to afford the French vine growers, whose vineyards have been ravaged by the phylloxera, an opportunity to re-establish them with resisting stocks. Already the prefect has had planted in a vineyard of his own 42,000 American shoots; and Mr. Catlin anticipates a very large demand for American vines throughout France.

**READING AT SEVEN AND A HALF MILES DISTANCE FROM THE CANDLE.**

On the evening of July 12, the Maxim electric light was put in operation on the tower of the Grand Union Hotel, Saratoga Springs, N. Y., with a view to test the extent of its illuminating powers. An open parabolic reflector was used—no lenses—and care was taken by Mr. Maxim to set the points of the carbons a little at one side of each other, and to adjust them to the exact focus of the reflector. When this was fairly accomplished the light was turned toward a spot in Ballston Spa, New York, 7½ miles distant, where, by previous arrangement, a group of several hundred persons were assembled to witness the experiment. So powerful was the light, so accurate the focusing and alignment, that the designated place in Ballston was instantly illuminated, so that ordinary print could be read, the time seen on watches, etc. The night was clear, still, and dark. The experiment was made at 9½ o'clock P. M. This is believed to be the greatest distance at which illumination of equal degree has been accomplished. We are indebted to Mr. H. S. Maxim for the above particulars.

**A COVERING WANTED FOR COTTON BALES.**

Among the matters of general interest brought forward at the recent convention of the National Cotton Exchange in this city, one ought to be of special interest to inventors. Speaking of the proposed reform in selling cotton, namely by net weight, President Lafitte said that it would be to the interest of planters not to have any allowance made for bagging. The cheap bagging now used is a poor protection to the cotton, and would soon be superseded under the new rule. In his own words: "If cotton were sold by net weight, some inventive genius would, in a few years, introduce good non-inflammable light material," for covering the bales, thus saving much waste, damage, extra freightage, and so on. The problem does not appear to be a very difficult one, and its solution would pay well. The disadvantages attending the use of unrotted flax bagging was particularly noted. The texture is rough and open, affording an insufficient covering, and allowing the cotton to deteriorate in value, while the expenses for mending the bales were considerably increased. Mr. John G. Dale, agent of the British and Foreign Marine Insurance Company, said that his company had sustained heavy losses from the use of such bagging, and had been obliged to make large deductions from claims by way of protest.

Mr. Trenholm estimated the cotton crop of this year at 5,250,000 bales. If they were placed together in one long string they would measure about 4,500 miles, and stretch from New Orleans to New York, and thence across the Atlantic Ocean. Every linear foot would represent 100 lb. of cotton. With regard to the prospects of the future, Mr. Trenholm said that now but one bale of cotton was produced to 2 4-10 acres of land, but it was possible, by proper management, as experience had demonstrated, to raise one bale to every acre. He believed that ultimately our crop would be 12,500,000 bales.

In view of these figures it is needless to urge the importance of the invention called for. Our wide awake inventors should see that the want is met promptly.

**A SINGULAR MEMORY.**

Marvelous stories are told of the curious memory of D. P. Hicks, a Rochester youth, associated with a not less curious faculty for distinguishing sounds. He spent his earlier years in Buffalo, N. Y., where he became known to railway men for his singular knowledge of locomotive bells and numbers.

A short time ago he removed to Rochester, where he is employed at a distance from the railway so great that he rarely hears a passing train. Yet he is able to give the numbers of nearly three hundred locomotives on hearing their bells. The engines that run in the night he names with unerring accuracy, as his house is situated near the track and the bells are heard very plainly. Railroad men state that this is the only case of the kind they ever knew. Old and experienced engineers, switchmen, and those whose work bring them within the hearing of a large number of engine bells, say that at the most they can learn to know only a very few compared to the great number Mr. Hicks can name readily, almost without thought. He can not only give the numbers of several hundred, but in cases where locomotives have been remodeled and renumbered, he can give the old number as well as the new one. He says there are six locomotives familiar to him, the bells of which are keyed in pairs. These six locomotives are the only ones, to his knowledge, in the old class, which have the same key. The new locomotives, that is, those the numbers of which are above 500, are all keyed nearly alike.

The Rochester Democrat and Chronicle relates that not long ago an old switch engine, used in the yard at Buffalo, was sent to Rochester for some special purpose. As it passed Dean street Mr. Hicks heard the bell and remarked that the engine was of a certain number, and that he had not heard its bell for six years. A boarder in the house,

anxious to test the case, ran to the track and found that Mr. Hicks was correct. Not long since the young man went to Syracuse on business. He heard an engine coming out of the round house, and remarked to a friend that he knew the bell, although he had not heard it in five years. When the engine came into view the number given was found to be correct.

This faculty, it is said, has been tested hundreds of times, and a mistake is rarely made.

**FOUR HOURS IN THE DARK.**

It is a humiliating confession to make—but geography is pitiless, and our national vainglory must bow to its decrees—that for four hours in every twenty-four the entire territory of the United States is deprived of sunshine. As the sun goes down on our farthest Aleutian island its morning rays are just lighting up the hill tops of the western coast of Ireland, and the breadth of the Atlantic lies between us and daylight. To our Fenian citizens this may be another and cogent reason for annexing the dear little isle of the harp and the shamrock; but until it is done the exultant cry of the Rocky Mountain Presbyterian, that the sun never sets on the United States, must be admitted to be a trifle exaggerated. It does set every day, and, paradoxically, four hours before it rises.

In the depth of our humiliation we may possibly console ourselves with the reflection that—though our British cousins can say with truth what we cannot—the sun really shines on the United States when it is up. We have to submit to four hours of sunlessness a day; England is lucky to get four hours of sunshine. So life has its compensations, and existence in the United States remains endurable, though we do not (geographically speaking) make quite so great a spread as we thought.

**The New Eddystone Lighthouse.**

The foundation stone of the new Eddystone Lighthouse was laid, August 19, by the Duke of Edinburgh. The formal commencement of the structure on the 21st of June, as first proposed, was prevented by the roughness of the sea. On the day of the final celebration the weather was rainy, but the water was sufficiently smooth to permit the carrying out of the programme.

The Eddystone rocks are situated in the English Channel, 14 miles southwest of the port of Plymouth and 12½ from Rame Head. They are almost in the line which joins the Start and Lizard points, and in the fairway of all vessels coasting the southern shore of England. Soexposed are they to the ocean swell from the south and west that even in comparatively calm weather the waves go raging and thundering over their ledges, and their name indicates the incessant swirl of the deep about them.

The new lighthouse will stand 127 feet from the present tower on the South Reef, a rock which the House Rock protects from the southwest, but which has the disadvantage of being much lower, its highest part being never uncovered before half tide, while the lowest parts, on which most of the foundation rests, are 4 feet beneath the low water level of an ordinary spring tide.

Most of the work done thus far has had to be done under water, and owing to the force of the waves the work could be carried on only at brief and specially favorable intervals. It is expected that the high water level will be reached early next year, when the work will proceed more rapidly, as the courses of stone are all accurately fitted together on shore. It is thought that it will take five years to complete the lighthouse, which is to follow generally the lines of the present one, though it will differ from it slightly in form and considerably in size. To a height of 25½ feet above high water mark the tower will be solid, with the exception of a space for a water tank. The side walls beginning at this level will be 8½ feet thick, diminishing to 2½ feet at the top. Nothing but granite will be used, and the blocks will be large enough to form the entire thickness of the hollow portion of the tower. Under the cornice, to the top of which it is 138 feet from the rock, the diameter of the tower will be 18½ feet; it will contain nine rooms, besides the lantern, each being 10 feet high and the seven uppermost ones 14 feet in diameter. The focal plane of the new lighthouse will be 130 feet above high water, as compared with 72 feet in the present building, and the actual useful range of the light will thus be extended from 14 to 17½ nautical miles. About 5,100 tons of granite will be employed in the construction, and 50 tons of iron for door casings and the like. The fog-bell, erected in 1872, will be replaced by a powerful siren and the electric light probably be used. The estimated cost of the entire work is between \$300,000 and \$350,000. A large engraving of the Old Light house, with a view of the foundation of the new structure, is given in the SCIENTIFIC AMERICAN SUPPLEMENT, for August 23.

**American Dental Convention.**

The twenty-fifth annual session of the American Dental Convention was held in Saratoga, August 12. The attendance was small. The relative merits of gold, amalgam, and other plastic fillings for teeth, were discussed, the prevailing opinion being in favor of the first named, and against the "new departure," so called, in the direction of substitutes for gold fillings.

**The Oldest Scientific Lecturer.**

M. Chevreul, now in his 93d year, began his usual course of lectures on organic chemistry at the Museum of Natural History, Paris, on June 10.

**A New Fluorescent Body.**

According to the Journal of the Chemical Society, C. O. Harz has discovered a new fluorescent body in *spergulin*. This product occurs in the seed-coverings of the caryophyllaceous plants, *Spergula vulgaris* and *S. maxima* (Anglice "Spurrey"). It is produced at the time when the seeds blacken and are nearly ripe. Spergulin is very soluble in absolute and aqueous alcohol. Viewed by transmitted light the solution appears nearly colorless, with a shade of olive-green; by reflected light it exhibits a dark-blue fluorescence. It has not yet been obtained in the form of crystals. It is very soluble in methylic alcohol, less so in amylic alcohol, and scarcely soluble in ether or petroleum. Concentrated sulphuric acid dissolves it, forming a dark-blue liquid. The fluorescence of an alcoholic solution of spergulin is maintained for more than a year if the liquid be kept in darkness, but is rapidly destroyed by the action of direct sunlight, and more slowly by that of diffused light. Small quantities of caustic alkalies, or alkaline carbonates, added to an alcoholic solution of spergulin, transform it into an emerald-green fluorescent body; and basic lead acetate produces a precipitate. The new compound contains 61.85 per cent of carbon, 7.05 of hydrogen, and 31.8 of oxygen. It appears to be related to chlorophyll, and is probably closely allied to phyllocyanin. An alcoholic solution of the product showed strong absorption, almost entirely in the violet; and in this respect differs considerably from chlorophyll, phyllocyanin, and phylloxanthin. Mr. Harz is disposed to regard spergulin as a feeble acid, the acid salts of which, as well as the acid itself, exhibit blue fluorescence, the neutral salts exhibit green fluorescence, and the basic salts are destitute of fluorescent properties.

**The Railroads of the United States.**

The twelfth annual number of Poor's Manual of Railroads of the United States is unprecedentedly full of information, owing to the more detailed statements furnished by the companies and the reports of State departments for the general oversight of railroads. For the first time for several years the introductory article is able to record a very decided recovery of the railway interests of the country from their recent depressed condition. The total mileage in operation at the close of the year was 81,841 miles, 2,694 miles of new line having been opened during the year.

The construction of railways has been entered upon with renewed energy and activity, and it is predicted that construction will proceed rapidly until the mileage is more than double what it is now. In the five years since 1873 there have been constructed in the United States 11,563 miles of railway. A remarkable feature in the railroad operations of the country for several years past has been the enormously increased tonnage in the face of a large falling off of earnings. The decline in earnings has been due to very great reductions in charges for transportation. Within the last decade the tonnage traffic of our railroads longest in operation has been fully doubled, while there has been only an inconsiderable increase in earnings from this source. Since 1873, the year in which the earnings of our railroads reached their maximum, the increase of their tonnage has equaled 50 per cent, although the period has been one of unexampled business depression. At the very time at which there has been the greatest complaint of hard times, the movement of merchandise has steadily and largely increased.

The gross earnings of all the roads whose operations have been reported, have equaled \$490,103,361, against \$472,909,272 for 1877, \$497,257,959 for 1876, and \$503,065,505 for 1875.

**Sydney Exhibition.**

The last number of the Illustrated Sydney News received at this office represents, by a number of well executed wood engravings, the progress of the Sydney Exhibition, showing the arrival and placing of exhibits from all countries, and exhibiting that same degree of hurly-burly activity which was witnessed just before the opening of our Centennial show, and which prevailed just before the opening of the French Exhibition last year.

From these illustrations and the statements of the newspapers of that far-away colony, the success of the Exhibition would seem to be secured. Now for the New York World's Fair in 1883. Are we to have it? If so, it is time steps were taken to select a site, and some announcement made of what the committee intend doing.

**Professor Archibald Geikie.**

Professor Geikie, the accomplished chief of the Geological Survey of Scotland, recently passed through this city on his way to the West. His purpose was to go first to Ogden, then, after visiting Salt Lake, to study the Wahsatch and Uintah mountains and the ancient lake basins of that region. On his return to the East, Prof. Geikie will deliver a course of lectures on "Geographical Evolution" at the Lowell Institute.

**The California Big Ferry Boat.**

We are indebted to Dr. Edward Gray, M.D., for some additional particulars concerning this vessel, the Solano, recently noticed in our paper. Her length is 425 feet; breadth, 115 feet; built at Oakland, where she is now receiving her finishing touches. The vessel is to ply on the Straits of Carquinez, between the railway station of that name and Benicia, and not on San Francisco bay as stated.