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THE TRAVELING ELECTRIC LIGHT.

Aside from the ordinary applications of it, the electric light has permitted certain effects to be obtained that could not have been with the usual sources of light. Thus, for instance, the projection of a powerful luminous fascicle upon a given point that it is desired to illuminate brightly could not easily have been effected with oil or petroleum. Such a result, with these means of lighting, cannot be easily obtained without the use of bulky and cumbersome apparatus, such as are applied only to fixed foci, like lighthouses.

For movable projectors the electric light alone is applicable. There is no need of recalling here the different apparatus of this kind that are used for army and navy purposes. They were represented at Munich only by a very simple apparatus, but one of quite large dimensions, which served to give certain intense effects of light in the interior of the Crystal Palace.

A more important arrangement, and one which contained some new features, was the lighting carriage of Messrs. Schuckert, Meistbaler & Co. In a certain number of cases it proves useful to be able to convey to a given place all the material necessary for an electric lighting, and so arranged that the lighting can be effected in a very short time. Such a necessity has given rise in military applications, for example, to vehicles designed to accompany the electric projectors. We have had occasion several times to speak of these apparatus in this journal. The one exhibited by Messrs. Schuckert, Meisthaler & Co. did not differ much from them. It consisted of a steam boiler and its water reservoir, and a four cylinder steam engine, which directly actuated a dynamo electric machine of the Schuckert system. But the interesting part of the apparatus was a second carriage, capable of being coupled to the rear of the first, and carrying a Piette & Krizik lamp, with the requisite arrangement for elevating it to a height of eight meters.

This ingenious arrangement was based upon the use of jointed parallelograms like those used by children for moving a whole army of toy soldiers, and which are called in Germany "Nürnbergsche scheere" (Nuremberg scissors).

The lamp support, or light tower, consisted of four of such apparatus, connected as shown in Fig. 2. When the apparatus is folded up for removal, it presents the aspect shown in Fig. 1. It is opened out simply by separating, along the grooves in the cross-pieces of the carriage, the four points that serve as a base to the system. The necessary distance apart is obtained by means of a screw actuated by a gearing and winch. The lamp is suspended at the upper part of the system by cords passing over pulleys, and, when the tower is lowered, it (the lamp) enters a cylindrical support placed in the center of the carriage, and this holds it in place while the latter is being moved about.

This apparatus was exhibited outside of the Crystal Palace, not far from the entrance to the exhibition. It was in operation before the public for several evenings, when the running of the machine was found to be regular and the light observed to be steady. Besides this, it was ascertained that it takes no more than five minutes to elevate the tower.

In order, however, to better judge of the apparatus from this point of view, it was taken on the 13th of October to one of the city squares, where, twenty minutes after the arrival of the two carriages, the machine was running, the tower was elevated, and the lamp was in operation. Despite a heavy rain, the light that was produced allowed a newspaper to be read at a distance of fifty meters. The apparatus, in short, seems to be very practical, and is certainly called upon to render services in certain military operations; for example, in that of throwing up earthworks, one that has to be done very quickly, and at which it is necessary to work day and night.

Another application of an arrangement of this kind upon which we cannot too strongly insist is that connected with work on the public streets. At Paris, for various reasons, almost all the work of this kind is done in summer, and the result is that there is considerable obstruction, due to the fact that the work is done at a large number of places at the same time. The use of apparatus like the one just described, by permitting of the work being performed at night, would fur-

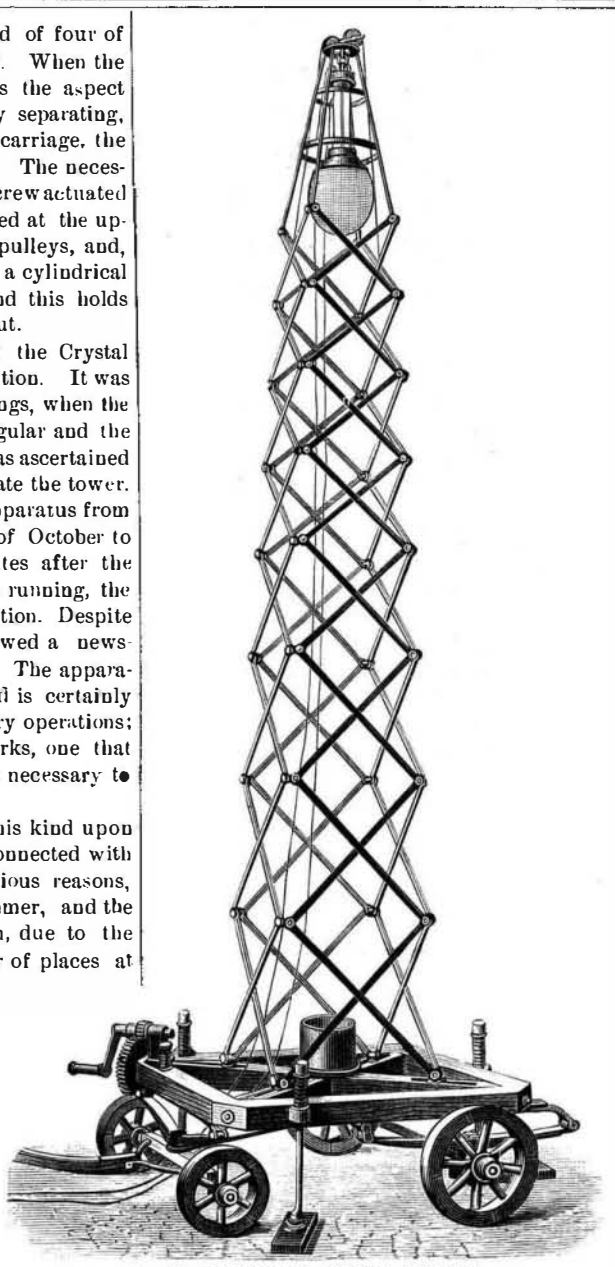

Fig. 2.—ELECTRIC LIGHT TOWER.

Fig. 1.—TRAVELING ELECTRIC LIGHT MACHINE AND LIGHT TOWER.

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nish a means of diminishing, by one-half, the duration of each operation and consequently each local obstruction. But since, on another hand, the work as a whole to be effected would take half the number of days by night work, half of it might first be done in the same period of time, and then the rest of it, and the general obstruction of the city would be reduced to a quarter, while at the same time lasting as long as at present. There would certainly be some expense connected with the organization of a plant of this kind, but would not this be made up by the greater rapidity with which the work would be performed? For it is certain that work performed in a contiuuous manner, by gangs of men that relieve one another, will be finished more promptly than if it were discontinued and begun again every day. With night work, the bridge Des Saints Peres would have now been given up to travel, while as it is it will be closed for a long time to come.

Incident Relating to Professor Atwater.

A memorial of the late Professor Lyman H. Atwater, of Princeton College, who died last June, has just been published. In the memorial sermon of Rev. Wm. M. Taylor the following incident is related: At the beginning of Dr. Atwater's final illness he would lie for hours as though asleep. After his partial convalescence he said to members of his family that when they had, doubtless, thought him to be sleeping he was in reality thinking with unusual energy; that his mind seemed stimulated to extraordinary acuteness on very profound subjects, reaching with great rapidity conclusions which in health would have been arrived at only after much longer thought. He added that he would like to get well enough to put some of those thoughts on paper, but he never gained his wish.

To Raise Plants.

A lady, whose beautiful plants are the delight of her life and the envy of all her acquaintances, revealed the secret of her success for the benefit of the readers of the *Evening Post* the other day. The soil is, she says, about two-thirds good garden soil, and the rest is sand. It is kept light and loose about the roots; they are watered as they appear to need it, and not according to any particular rule; but the chief reason for their wonderful growth and bloom is this: "When any of the leaves wither and fall, instead of picking them up and throwing them away, I make little rolls of them and tuck them down in the earth and let them decay; and this is the only fertilizer I have ever used. This," she added modestly, "seems to be nature's way. And the plants that have the afternoon sun only, grow and rival those that have the morning sun."

Death of Dr. Gale.

Dr. Leonard D. Gale, an old well known scientist, and for a number of years an examiner in the chemical class at the Patent Office, died in Washington on October 23, at the age of eighty-three. He was a great friend of Prof. Morse, and assisted him in building the first telegraph line between Washington and Baltimore. Dr. Gale went to Washington in 1846, and has since resided there. It was said in the early days of the electric telegraph that Prof. Henry's discoveries in electricity contributed very much to Prof. Morse's success, and that Dr. Gale was the mutual friend of both.

More than thirty years ago the writer became acquainted with Dr. Gale while an examiner in the Patent Office. He was greatly respected by his associates and those having official business in his department at that time.

Vegetable Wool.

The *Moniteur des Fils et Tissus* calls attention to a description of vegetable wool called *Kapoc*. It comes from Java, and a specimen is on view at the Amsterdam Exhibition. It arrives at Amsterdam in its leathery covering, being itself enveloped in the seeds. It is then freed from both, and is carded so as to make a very light mattress wool, worth about 8¾*d.* per pound. One of the houses engaged in this operation had made trials in spinning and dyeing this material, but the filaments are said to be like strings, and their industrial application consequently a matter of uncertainty.

A Car Load.

Nominally a car load is 20,000 pounds. It is also 70 barrels of salt, 70 of lime, 90 of flour, 60 of whisky, 200 sacks of flour, 6 cords of soft wood, 18 or 20 head of cattle, 50 or 60 head of hogs, 90 or 100 head of sheep, 9,000 feet of solid boards, 17,000 feet of siding, 13,000 feet of flooring, 40,000 shingles, one-half less green lumber, one-tenth less of joist, scantling, and other large timbers, 340 bushels of wheat, 400 of barley, 400 of corn, 680 of oats, 300 of flaxseed, 366 of apples, 340 of Irish potatoes, 300 of sweet potatoes, 1,000 bushels of bran.

The Patriarch Chemist.

On September 1, M. Chevreul, the Nestor of chemists, completed his ninety-eighth year of age. He was born at Angers, in the night of August 31, 1786. At the early age of 20 years he was conservator at the Museum. Among his great discoveries in chemistry, figure prominently the separation of the fat bodies and the chemical constitution of oleine, stearine, and margarine. To him is also due the doctrine of the contrast of colors, of their shades, and of the determination of shades.

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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 410,

For the Week ending November 10, 1883.

Price 10 cents. For sale by all newsdealers

SUBSTITUTION OF STEEL FOR IRON.

Builders of machinery and machine tools are rapidly substituting low steel for refined iron in the parts of machines subjected to strain, and yet requiring stiffness. Low steel is extensively used in drop forging, and for many objects is preferred to Norway or Swedish iron. It will bear as soft heating, leaves cleaner lines, and is superior in stiffness, although it is exceedingly tough and fibrous. For piston and valve rods, for small finished shafts, rod connections, and many other uses heretofore filled by iron, steel is now generally preferred. When well made and rolled or hammered into rods and small bars, the toughness of this sort of steel is remarkable; a specimen recently noticed being a bar seven-eighths of an inch in diameter, doubled cold, and the bend hammered flat under a heavy atmospheric hammer without breaking the fibers. But one of its best qualities is its rapidity of being worked, and the cleanliness of the job.

The steel is measurably pure, containing no "sand bars," or spiculæ of hard iron, that either take the edge off the turning tool or the planer cutter, or break the points off. The cutter may be set to size in a lathe or on a planer, and the steel works so even that the calipers or the try gauge is scarcely required for a run of several feet continuously. This steel is admirably adapted for the feed screws of lathes, particularly for screw cutting lathes; the thread being cut so clean that it will gauge to the one-hundredth part of an inch before taking the scraping or finish chip. The durability of steel as compared with iron is so much greater that the value of the rolling and sliding parts is largely enhanced, and fits can be made with much closer accuracy, while the increased first cost of material is nearly, if not quite, made up in the greater facility of working.

NOVEMBER METEORS.

The earth will break her way through the November meteor-zone about the 13th of November, and proof of her passage will be furnished by the appearance of a few meteors proceeding from the constellation Leo at the time indicated. The meteor-zone is so broad that it takes the earth two or three days to traverse it, and the nights of the 12th, 13th, and 14th are the times to watch for the meteors. It will be necessary, however, to wait till 1899 for a grand star show, as this immense group of tiny atoms travels in an ellipse of such vast dimensions as to require 33¼ years to complete a revolution. The reason we do not have a star shower every November is because the meteors, instead of being uniformly distributed throughout the zone, are principally collected in a great group in one part of it. If the earth crosses the zone at a time when the principal group is in the part she is crossing, we have a shower that forms one of the most grand and brilliant sights ever seen on this planet. About a dozen of these magnificent November showers are on record. The Chinese, Arabian, and other historians have handed down many accounts of the wonderful meteoric showers. An Arabian writer reports: "In the year 599, on the last day of Moharrum, stars shot hither and thither, and flew against each other like a swarm of locusts; this phenomenon lasted until daybreak; people were thrown into consternation, and made supplication to the Most High; there was never like seen except on the coming of the messenger of God, on whom be benediction and peace."

In 1799 Humboldt, then traveling on the Andes, saw before sunrise thousands of meteors in the space of four hours, leaving a track behind them from five to ten degrees in length, many of them having a nucleus as bright as Jupiter. In 1833 there was a shower marked by grandeur and sublimity. The meteors passed over the heavens like flakes of snow, and, according to Arago's estimation, two hundred and forty thousand of them fell in three hours, as seen from his place of observation. In 1866 the latest shower was observed in Europe, and a portion of it was seen in America in 1867. The next shower is due in 1899, and is eagerly anticipated in the hope that it will confirm several theories based upon present and previous observation.

The November meteors have a curious and interesting history. It was found by Tempel, of Marseilles, in 1865, that a faint telescopic comet was moving in the same orbit, and that the meteoric showers are caused by the earth's encountering a swarm of particles following Tempel's comet. In other words, the comet is slowly disintegrating, and being transformed into meteors that will eventually fill the whole zone, when the grand showers will cease, and a display of greatly smaller proportions will take place every year.

The history of the November meteor-zone is a romance of meteoric astronomy. According to Leverrier—and some portions of his theory need confirmation—about the year 126 of the Christian era, Tempel's comet passed so near Uranus that the powerful attraction of the planet bent it from its former course and imprisoned it within the bounds of the solar system, causing it to describe an immense ellipse or gigantic hoop, whose aphelion lies beyond the orbit of Uranus, and whose perihelion rests upon the earth's orbit. The time intervening between the great showers, 33¼ years, proves the period of the revolution of the meteor-zone. It is only at these intervals that the earth crosses the brightest portion of the zone, consisting of the nucleus of the comet and swarming meteors into which it is being transformed. The November meteors start from a point in the constellation Leo, and are for this reason called Leonids. Leo is favorably situated for observation about 3 o'clock in the morning, which is a good time for picking up the few stray meteors, which, impinging against the earth's atmosphere,

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