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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 504,

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MEETING OF THE NATIONAL ELECTRIC LIGHT ASSOCIATION.

However skillful the mechanician, he may reasonably hope to gain something by a comparison of work with his fellows. The one may have found a simple means of performing what before was a difficult operation, and the other hit upon a plan reducing the cost of operation. Let them come together and exchange ideas, and it is readily seen that both will be benefited. This comparison of work is of the most importance where new processes are in course of development. Seeing this, the electric lighting fraternity have at last bestirred themselves, and formed an organization for mutual advantage and instruction. This organization, called the National Electric Light Association, met last week at the Union Square Hotel, New York city, and the three days' sitting of the convention brought out much that is interesting to the general public and a great deal that is of importance to those engaged in operating electric lighting plants. The most important papers and addresses were upon the advantages of electricity as an illuminant, proper construction and arrangement of engines and boilers, incandescent lighting, past and present, tower system of electric lighting, and underground wires.

The value and necessity of comparison of processes was clearly illustrated at many points in the discussions. Allowing for the difference in price of coal in one section of the country and another, some were found to be paying twice, and in one case—a plant in Iowa—nearly four times as much for the maintenance of 2,000 candle power arc lights as others. This disparity in cost was shown to come from the use of engines not fitted for the work, or from bad arrangement of grates and boilers. It was shown that shafting is a great waste of power in an electric light machine, and the use of countershafting a positive waste of money. Those plants give the best satisfaction, and are most economical, in which the engines and dynamos are coupled up directly. A curious fact was brought out during the meeting concerning the effect of the introduction of electric lighting upon the business of the gas companies. It would naturally be supposed that, when the electric light came to be generally used in the streets and offices of a town, there would be a relative diminution in the demand for gas. Yet the contrary, it seems, is the case. It was testified to in the convention, and confirmed on all sides, that wherever the electric light was introduced the gas companies greatly increased their business. This phenomenon is thus accounted for: The public get accustomed to more light, and therefore use more gas burners. Stores and show windows where gas is used look dim and dingy near others lighted with electricity, by reason of the contrast, and this appearance can only be rectified by turning on more burners.

In the paper on tower lighting, the author scarcely maintained his point that it was more efficient than pole lighting for the illumination of cities, though it seems to have some advantages, notably that of being less trying to the eyes. He cited the case of the lighting of Detroit, Mich., by a system of iron towers and masts, similar to those in use in Union and Madison Squares in New York city. The area to be lighted is 10½ square miles. The system comprised 90 skeleton iron towers, being for the most part 150 feet in height. In the thickly populated districts these towers are placed in the form of triangles, something less than a fifth of a mile apart, while in the outskirts of the city they are half a mile apart. There are nearly four hundred 2,000 candle power voltaic arc lights in all, and so thoroughly was the city illuminated by these last year, and so satisfactorily, that the citizens, so the author said, demanded the renewal of the electric light company's contract for the coming year.

The cost to the city of Detroit is, it seems, more than double what it was with gas, but the electric light people insist that the city is furnished with more than twice as much light as formerly; and whether this is so or not, the city inferentially shows its appreciation of electric lighting by its renewal of the contract, though there is reason to believe that even more satisfaction would be given by the use of the ordinary pole lighting, such as is in use in Broadway, Fifth Avenue, and other New York streets.

The paper on underground wires, though the last to be read, is perhaps of the most interest to the general public, owing to the present controversy and complication. The author began with something like a eulogy of a certain telegraph company, which has not particularly attracted attention for broadness of policy or for commendable practices. This company, according to the author, began burying its wires ten years ago, but recently it has been discovered that the gutta percha insulation of its line has been destroyed by the effects of the steam heating pipes, and it has been abandoned. The system used was that in vogue in England—the simple drawing of gutta percha cables through ordinary gas pipe.

In the opinion of the author, and he has had an extensive practical experience in such matters, the sinking of the arc-light wires is an exceedingly difficult problem, which will require much thought and many dollars to solve. He said: "So far as the arc-light companies are concerned, the present movement is well timed, as reconstruction would have to be begun in any event. The present lines are not of a permanent character, and the insulation is not in the best condition. I believe that the subway commission will prepare a plan for the accommodation of all services, and that when it is carried out, all companies can by lease or purchase obtain perpetual rights in such subways. No system will be approved that is not sufficiently comprehensive to meet the demands of all classes of service." But later on in the paper the problem of burying the arc-light wires appeared not to be so difficult after all, for the author described a system of underground conduits now in use in Chicago, in which these arc wires work well along with telephone and telegraph wires. This conduit, he said, is made of concrete, the result of mixing asphaltum and silex, and is moulded and at the same time hammered into lengths of about three and a half feet, through which are formed at the same time longitudinal ducts, the whole looking not unlike a tubular boiler. One end is provided with a flange to allow for the secure joining of the section; being cemented with the same material of which they are made—applied hot. Manholes are arranged at the intersections of the streets for renewing and repairing.

Perhaps this Chicago line, though entirely successful thus far, should be regarded as a makeshift, rather than as a permanent construction. For it is not yet known, as the author inferentially admitted, whether or no it would withstand the test of time as well as it withstood the government test of 5,500 pounds crushing strain per inch.

CAR SEATS.

That an entirely new departure in car seat construction is needed is apparent to any one who has studied the American car. One difficulty to be met and overcome is the insufficient width of the American car body. Bodies from twelve to eighteen inches wider than those now in use may safely be carried on trucks of the standard gauge, even at high rates of speed. This has been done for years on the Erie road, without accident. A wider car would, however, call for radical alterations in stations, platforms, bridges, tunnels, signal towers, and even in the tracks of some roads.

Such alterations and improvements cannot be looked for at present. More room in the seats can be obtained by sacrificing one seat in the width of the car; the space thus gained being given to the aisle and the three remaining seats. Many faults of car seats may be corrected without structural changes in the cars themselves. One glaring fault is the insufficient width of the seat, from front to back, which does not properly support a full-grown person. The cushion is of improper shape, being highest in the middle; a form made necessary by the reversible back, although its convex form is much better than those in which an attempt has been made to fit the person. The back is too low to comfortably support the head and shoulders, yet it projects from seven to eight inches below the level of the seat, and is so much too wide. This wastes a large quantity of expensive covering material. Most backs do not give support at the proper place, and are convex on the corners, where concavity is needed. They should be convex both horizontally and vertically. The seat, from seventeen to eighteen inches high at the front edge, is about right for a six-foot man, yet the foot rest is too far away to be of use even to a tall person, and is beyond the reach of others. With a practicable rest the present height would be proper. The seat frame, while bulky and heavy, is not strong, and is placed so low that there is no room beneath the seat. By simple modifications of the frame, this space could be utilized and made available for satchels, etc.

Another evil belonging to the reversible back is the necessity for making the seat parallel with the floor. A tilting seat, which tips the frame one-half or three-quarters of an inch, has in a few cases been adopted. It costs much, and the advantage is not appreciable. The inner end of the seat is well covered with catches, mouldings, and bars which search out tender portions of the anatomy. The sharp moulding is architecturally correct on the window rail, because as a cornice it crowns a wall. This may satisfy the architects, but common passengers would rather violate architectural proprieties, and have round corners well cushioned.

Alterations are needed in the aisle end of the seats. The fashionable wood end is less comfortable than the old style of iron, and is inconvenient because it is open. The arm rests are hard, and the "nickel plated horse rasps" of some roads are a public nuisance. A plush surface is by far the most satisfactory.

The following average dimensions of passenger cars and seats will give the inventor some idea of the problem before him: The inside width varies from 9 feet 2 inches to 8 feet 5 inches above the truss plank, below, or within 11 or 12 inches of the floor; the car is usually from 2½ to 4 inches narrower. Seats are spaced from 26 to 36 inches between centers, and have from 11 to 18 inches in the clear at the level of the seat. The latter is a liberal figure. The back is from 36 to 37 inches