In the Field of Electricity

Niagara as a Money Maker.

THE ease with which state legislatures and city governments grant franchises of great value without compensation is a subject of comment and criticism far from creditable to the American system of government. Nearly fifteen years ago the state of New York granted the first franchise for utilizing the water power of Niagara falls, resulting in the development of electric power of far greater commercial value than was considered possible at that time. Defenders of the free franchise system in this case point to the benefits conferred on the community in industrial progress, and the great advantages nearby communities, such as Buffalo, derive from cheaper power as sufficient compensation for the privilege granted. The argument serves its purpose in soothing discontent largely because the public has no immediate remedy. Our easy give-away methods, as illustrated at Niagara falls, serves to make a sharp contrast with the methods of the Canadian authorities in driving a bargain with electrical power companies on the Canada side of the falls.

The nineteenth annual report of the commissioners of Victoria park, the free pleasure ground on the Canadian side at Niagara, has much in it of interest to the industrial development on the New York section about the falls of Niagara, as well as to the Province of Ontario. In fact, the showing it makes as to what great power companies can afford to pay for the rights to develop power from a stream is of vital concern to every section of the country where water powers are available for development. The Canadian Niagara Power company has paid the commissioners the surprising sum of $224,677.78, and today has only 30,000 horse-power available, its initial generator having been started on January 2 last. In time it will have 110,000 horse-power, but in addition to its annual rental it will have to pay a tax on every horse-power developed above 10,000.

The Ontario Power company, the second to secure rights in the park, but which has no power yet developed, has paid $150,000 to the commissioners. The Ontario Power company has located its power house at the water's edge in the gorge, and will develop 180,000 horse-power, the first of which will probably be ready for use this summer.

The Electrical Development company of Ontario, limited, has paid $30,000 to the commissioners, and its tunnel and wheel pit are now being lined. It will be the latter part of the present or the first of the next year before it will have power for sale.

Thus, the power companies have paid $364,777.78 to the commissioners, and are not yet utilizing the services of the rights they purchased. Since it was started, the electric railway that runs through the park has paid them no less than $132,500, while the photographic privilege has contributed $103,700. Added to this amount we have the amounts paid for the other concessions, and it is found that the commissioners have received a revenue of $620,777.78 from the privileges granted, all but one having to do with the use or development of electrical power in the park. Similar privileges on the American side pay nothing.

Standardizing Electrical Machinery.

At a meeting of the Institution of Electrical Engineers in London, the other day, E. H. Rayner submitted a paper, communicated by Dr. R. T. Glazebrook, F. R. S., reporting on temperature experiments on electrical materials carried out at the National Physical laboratory. The investigations described in the paper, summarized by the Boston Transcript, were undertaken at the request of a subcommittee of the Engineering Standard's committee. In standardizing electrical machinery, the temperature at which it is permissible to run the machinery is an important factor, and the committee wished detailed information as to the value that it would be right to give in their regulations for this temperature. This temperature clearly depends on the properties of the insulating materials used in the coils of the machines, such as cotton, varnish, press-spahn and the like, and as the object was to investigate the electrical and mechanical properties of these substances at the normal temperature, and at various high temperatures, temperatures of about 75 degrees, 100 degrees and 125 degrees C. were selected, and the materials which were supplied to the committee by the firms using them, were exposed for some three months to these temperatures. The di-electric and resistance properties were measured in the usual way, and the results are shown in the tables accompanying the paper.

To measure the mechanical properties, the force required to punch the materials with a punch having a circumference of one-half inch was carefully measured, and the effect of bending the materials round cylinders of gradually decreasing radius was also observed. In this way an estimate was formed of the reliability of the various materials used, and it appears from the tables that most of the properties except, perhaps, the flexibility, are improved by heating at 75 degrees, that the fall, if any, in the insulating properties is not marked at 100 degrees, but when temperatures of 125 degrees are reached the mechanical properties in most cases show grave deterioration. It would appear from the results that temperatures of from 100 degrees to 110 degrees may be employed in the machinery without risk.

During the course of the investigation several interesting results as to the effect of moisture on these materials were observed, and Mr. Rayner was able to show an experiment illustrating the changes that take place in the insulating properties of cotton as the moisture is driven out and the cotton finally carbonized. For the purposes of the committee it was not sufficient to know what temperatures the material used would stand, but, in addition, the actual temperature that might be reached at any point if the machine required investigation. There are various means of measuring average temperature of the field coil of a dynamo, but very little information was available to determine by how much the temperature at any one point might exceed the average. To determine the temperature at various points within such coils, thermo-junctions and iron-eureka wire were inserted, and Mr. Rayner was thus able to plot the temperature curve throughout the substance of the coil. The coils were in all cases run at the National Physical laboratory. They were then taken to the makers' works and a further series of investigations of temperature, distribution, etc., were made with the coils on the machines running under various conditions of load. The mean temperature of the coils is determined by their electrical resistance, and thus it is possible to tabulate a series of particulars giving among other information the differences between the maximum temperature obtained at any one point in the coil and the mean temperature. The maximum difference varies considerably with the conditions of working, but it would appear that it rarely exceeds 25 degrees C. The results achieved will, it is hoped, enable the engineering standards committee to specify the conditions of tests for motors and generators in the future. A series of tests such as those described could only be carried out by the co-operation of a central institution such as the National Physical laboratory and the various makers who have supplied the machinery, and any value that the tests may have is greatly increased by this co-operation.

New York's Night Signs.

Broadway is made uncommonly brilliant at night by electric lights.

There is nothing to equal this show in any other city in the world. The electric signs play a big part in making Broadway the brightest street in the world at night.

Yet appearances are deceptive regarding these electric lights. They are so conspicuous, so eye-filling, that there appear to be many more than there really are. On Broadway between Twenty-third and Forty-fifth streets there are about fifty signs, averaging about two to a block. You'd think there were five times that number, so assertively do they stare and glare at you from everywhere. They seem to take up so much space, to be so ever present.

Not only are the signs fewer than they appear to be at a glance, but the number of incandescent lights used in them will strike the layman as being surprisingly small. Instead of a myriad of the small globes, there are in reality only 9,000 in round numbers in the signs in the territory. Six thousand of these are in the later signs alone.

The biggest electric sign in the world sends a flood of light to the westward from one of the tall buildings below Fourteenth street. It is visible from Newark.

The first letter of the sign is sixty feet high and the others fifty feet, and there are nine letters. And yet there are only 1,500 individual lamps in the whole sign. Moreover, the lamps are very small.

Each is only four candle power. These small globes have been found to work better in this particular sign than globes of sixteen candle power. The expense of maintaining the gigantic sign is only $3 nightly.

One district of electric lighting takes in that part of the city between Eighth and Fifty-ninth street and from river to river. About 30,000 globes are used for the signs in the whole district. There are something over 200 signs in the district. The large display for the small number of lamps is a striking feature.

No less conspicuous than the signs themselves are the many forms they take, admitting a wide range of decorative effects from plain to fancy. The talking sign, where the light runs along from letter to letter is worked by means of perforated rolls on cylinders, the mechanism being run by a small motor and doing the lighting of the required letters automatically.

Wireless in a Home.

A New York electrical engineer has equipped his home with a miniature wireless telegraph system with which he communicates all his wishes from the dining room to the kitchen. On the dining room table is a dainty transmitter and pole connected by a flexible cord with a battery under the table, and in the kitchen is another transmitter and receiver connected with an electric bell. The transmitters are no larger than ordinary paper weights. Messages are transmitted from dining room to the kitchen through the walls, and the bell rings, and through the agency of a simple system of signals anything desired in the dining room can be called for.

Another Electric Lamp.

Although the world has had at least two fairly satisfactory means of utilizing electricity for purposes of illumination for at least a quarter of a century, inventors have long felt that perfection had not been reached. New types of apparatus are being devised from time to time, and it is evident that evolution is still in progress. The latest candidate for favor has made its appearance in Berlin, and it was described before a technical society in that city only a few days ago.

Beginning where his predecessors left off, says the New York Tribune, Edison first attempted to make a durable lamp in which the glowing filament consisted of platinum. Not until he substituted carbon for that material did he accomplish much. Nevertheless, a number of subsequent experiments have been made with metals. It was reported a few years ago, for instance, that osmium, which is closely related to platinum, had been successfully tried, but as nothing more has been heard of the matter it is probable that the announcement was premature. Cooper Hewitt, it will be remembered, uses another metal, mercury, converting it into vapor before producing incandescence. In the Nernst lamp, which originated in Germany, light is derived from a tiny rod of magnesium that is heated by the current passing through it. The invention which is now attracting in the same country and which is the work of electricians named Bolton and Feuerlein, also represents a recurrence to metal, but unoxidized and in a solid form. Tantalum, which is sixteen times as heavy as water, has been adopted. Owing to its high conductivity it has been found impracticable to make the filament less than two feet long, but as the thread can be conveniently coiled into a spiral, no more space is required than is afforded by the Edison bulb.

The most that can be said in behalf of the tantalum lamp at present is that it yields more light for the same amount of current than does one of the old kind. In this respect its efficiency is twice that of the established favorite. It appears to be no more durable, however, its construction is more complicated and the first cost should certainly be much greater, although nobody seems to be in a position to say just how much. These drawbacks more than counterbalance the one merit of the new device, apparently, and commercial success is far from being assured. One of the great German houses which manufacture electrical apparatus, Siemens & Halske, has taken the lamp up, and the latter could not well make its appearance under better financial auspices. It will undoubtedly receive a thorough trial in the next year or two, but at the end of that time it may be regarded as nothing more than a scientific curiosity.

British View of American Progress.

Lieutenant Colonel R. E. B. Crompton of the English electrical engineer corps gives his impressions of America in the anniversary issue of the Electrical Magazine of London. He says in part: "I did not find that our American friends were ahead of us in any marked degree, as many English journals, technical as well as non-technical, would lead the English public to suppose. On the contrary, I found that although no doubt America could show a very large number of large installations, and consequently there is a considerably larger field for the employment of engineering talent on that side than there is over here, as regards general engineering ability, managing and organizing power, I think our English engineers were in all respects the equals of the Americans; in fact, in some respects, notably in the question of economics in the working of electrical supply systems, the severe competition by gas which prevails in this country has rendered our English central station engineers rather more efficient in these respects than the Americans. Next as to manufacture. The Americans, of course, manufacture on a much larger scale than we do in this country. Their home market is of itself many times larger, but I do not think the individual organization or laying out of the electrical factories, or of similar factories where mechanical engineering of approximately the same class is being carried on, is notably, factories in this country; in fact, I think if at all, superior to the same class of the proportion of up-to-date factories here is as great as it is in America, and conversely the proportion of out-of-date old-time shops that still exist is as great in America as here. In fact, not a few of the shops that I had an opportunity of visiting would, if reported on by the English technical press, be said to be awful examples of old-time practice. There is one point, however, on which I think all who took part in the tour are agreed, and that is the immense superiority of the American telephone system in all their towns, to anything we have in England. The telephone in America was a delight and a luxury which one feels all the more as soon as one returns to the miseries of the London system."

RELIGIOUS NOTES.

Rev. Frederick Bender, a wealthy priest of Denver, has decided to build a church at a cost of $100,000, in a district of the city now without church accommodations.

Archbishop Mesmer of Milwaukee has had to ask police protection against the importunities of beggars, following an article in a local newspaper telling of his liberality as a giver.

Ex-Mayor Low of New York, who has become a religious enthusiast, is planning for great revival services under canvas. A number of rich men have joined with him and have agreed so to finance the undertaking that the plate will not have to be passed at any of the meetings.

Rev. F. G. Brown, one of the editors of the Western Christian Advocate, has resigned and will re-enter the ministry. He will be succeeded by Rev. Robb Zaring of Indianapolis.

The pastor of Holy Name Catholic church of Sheboygan, Wis., is trying to stop promiscuous dancing by getting pledges from his 3,000 parishioners to attend only dances in the church hall.

Very Rev. M. F. Fallon of Buffalo, provincial of the Oblate Fathers, has been in Washington, where he purchased fifteen acres of land for the purpose of erecting this summer a house of studies for the members of his order.

The late Thomas L. Clark, bishop of Rhode Island, widely known as a wit and scholar, in his own home life in Providence preferred the utmost simplicity compatible with comfort. Having on one occasion a distinguished English divine as a visitor, the latter was considerably impressed, not to say astonished, at the lack of ceremony observed in the Episcopal mansion, and upon retiring hesitatingly inquired if he should leave his shoes outside his door. "Certainly, if you like," replied the bishop, with cordiality, "nobody'll touch 'em."