

luminous arc standards 106 feet apart and 27 feet high. The installation cost was about \$6.50 per front foot of property, and the annual operating cost is about \$1.00 per front foot.

The Broadway system at Saratoga Springs is of interest in that about a mile of street is to be lighted by 69 of the new "Duoflux" units mentioned above. Each of these units contains two lamps, one of 1000 candle-power and one of 250 candle-power. This installation, which is to be put into operation about June 1920, will cost about \$32,000 for its installation and for operation, about \$10,350 per annum.

CONTRIBUTIONS TO THE ART

Important papers contributed during the year include a discussion entitled "Coefficients of Utilization" by Ward Harrison and Earl A. Anderson, published in the March 20, 1920 issue of the *Transactions* of the Illuminating Engineering Society. This paper presents a method for the direct determination of coefficients of utilization applying to installations of all ordinary types of lighting units in rooms of varied proportions and different ceiling and wall colors. Actual colors for ceiling and wall surfaces covering 32 different shades with the corresponding reflection factors are included in the printed paper.

A paper on "Opportunities of Extending Lighting through New Applications" was read by R. M. Searle before the annual convention of the Illuminating Engineering Society in October 1919, which contains references to the following divisions of the lighting field: Street Lighting, Display Lighting, Flood Lighting, Lighting of Freight Terminals, Industrial Lighting, Stairway Lighting and Lighting for Community Affairs, this list giving an idea of some of the fields in which developments may be expected.

The following quotation from an address of President S. E. Doane before the Thirteenth annual convention of the Illuminating Engineering Society is of interest:

The war has taught us that we have been regarding electric lighting, to use a phrase that one of my associates has given me, as a janitor service, whereas we should have looked at lighting as an item in the cost of production or in the cost of sales, and regarded it as any other factor in the cost. Then we would have examined, as have men within the last year or two, under what light we could get the maximum of visual acuity or speed of visual reaction. During the war time we have had some demonstrations. Mr. Durgin has given the most and the best of the practical demonstrations of how to apply this knowledge that visual acuity increases with the intensity of light and the speed of reaction increases production.

Its application to production has been spectacular, and the results have been remarkable. As a matter of interest and as a measure of our opportunities I would like to use some figures from the lamp industry. Sixty-five per cent of the output of the lamp manufacturers, according to our estimates, is used in that portion of our business which would be affected by this knowledge. In other words, more than half of the electric lighting of this country can be affected and will be affected by the better knowledge we have of the production or increase in visual acuity and speed of visual reaction under intensive lighting.

For those who may be especially interested in the progress of the lighting and illumination art, attention is directed to the annual report of the Committee on Progress published each year by the Illuminating Engineering Society. The last report of this kind, covering 80 pages, will be found in the *Transactions* of the Illuminating Engineering Society for November 20, 1919.

C. E. Clewell, *Chairman.*

ANNUAL REPORT OF THE POWER STATION COMMITTEE

To the Board of Directors,

DURING the year 1919-1920 the Committee held two meetings, mainly devoted to discussion of papers presented, in person by the writers for comments and suggestions. The contributions to the activities of the Institute under the auspices of this Committee were as follows:

A symposium on steam turbine design, with the following papers:

Present Limits of Speed and Power of Single-Shaft Curtis Steam Turbines, by Eskil Berg.

Present Limits of Speed and Power of Single-Shaft Steam Turbines, by J. F. Johnson.

Present Limits of Speed and Output of Single-Shaft Turbo Generators, by F. D. Newbury.

A plea for standardization in statistical records of state and governmental bodies reporting efficiencies of power plants, with the presentation of the following paper:

Essential Statistics for General Comparison of Steam Power Plant Performance, by W. S. Gorsuch.

A symposium on excitation, with the papers to be presented at the Annual Convention as follows:

Considerations which Determine the Selection and General Design of an Exciter System, by J. T. Barron and A. E. Bauhan.

Factors in Excitation Systems of Large Central Station Steam Plants, by A. A. Meyer and J. W. Parker.

Exciters and Systems of Excitation, by H. R. Summerhayes.

Application of D. C. Generators to Exciter Service, by C. A. Boddie and F. L. Moon.

Exciter Practice in the Northwest, by J. D. Ross.

Generator Excitation Practice in the Hydro-Electric Plants of the Southern California Edison Company, by H. H. Cox and H. Michener.

The committee also considered the question of making suggestions for the activities of the incoming committee for the ensuing year, and recommended for consideration the following:

Safe Maximum Limit of Operating Capacity for Each Section of Bus.

Reactive Component Dispatching.

Auxiliaries in Steam and Hydro-Electric Plants.

Fighting Generator Fires.

Trend of Modern Power Station Design.

PHILIP TORCHIO, *Chairman.*

ANNUAL REPORT OF THE ELECTRO-PHYSICS COMMITTEE

To the Board of Directors,

THE Electrophysics Committee desires to receive suggestions for future work. It seems well, therefore, for this purpose to re-state from the report of last year the policy that this Committee has endeavored to carry out. It is as follows:

1. To encourage original papers of high technical standard, marking advances in electrophysics.

2. To have each year a broad, interesting, general lecture, free from mathematics, dealing with modern physics.

3. To promote a more complete cooperation and mutual understanding between the engineer and the physicist.

It is our object to keep open the "line of communication" between the pure physicist and the strictly applied physicist or engineer.

A joint meeting was held with the American Physical Society in Philadelphia, October 10-11th. The Physical Society session gave a notable discussion on the present status of theories of atomic structure. A review of this subject designed for engineers has been printed in the JOURNAL. The A. I. E. E. papers showed how these theories had been practically applied in the study of crystal structure and in the solution of vacuum tube problems. Other papers covered a variety of subjects marking advances in electrophysics.

Talks were given in an evening session by past presidents of the two Societies. It was the object of these talks to promote cooperation. The titles are significant—"The Indispensability to Each Other of Pure and Applied Science" by H. A. Bumstead; "Pure Science and Industrial Research" by J. J. Carty.

Additional technical papers have been given at other sessions.

F. W. PEEK, JR., *Chairman.*

ANNUAL REPORT OF THE TRACTION AND TRANSPORTATION COMMITTEE

To the Board of Directors,

TWO meetings were held under the auspices of the Traction and Transportation Committee; one at the mid-winter convention in New York in February, and the other at a regular meeting of the Institute in Pittsburg, March, 1920.

At the New York meeting there was presented and discussed a symposium paper entitled: "The Economic

Supply of Power for the North East Atlantic Seaboard." This paper made reference to an item before Congress calling for a survey of the situation between Boston and Washington looking toward the establishment of a national policy in the matter of the generation and distribution of power through the means of which large economies could be effected as applying to labor, fuel and other materials.

The meeting passed a unanimous vote recommending that the Board of Directors of the Institute appoint a special committee to be known as the "Committee on Super Power System." This committee has since been appointed.

Since the above meeting, Congress has approved the proposed survey and appropriated \$125,000 for the purpose.

The Pittsburg meeting included the presentation and discussion of papers relating to the design of the Minneapolis and St. Paul Electric locomotives by the General Electric Co. and by the Westinghouse Electric and Mfg. Co.; also papers concerning automatic substations and protection to substations.

Both of these meetings were largely attended and much valuable information and data were presented, all of which has appeared or will appear in the TRANSACTIONS.

There seems to be no disagreement on the part of any members of the committee in the Conclusion (1) that Super Power Systems stand as future guarantors for economical generation and distribution of power and (2) that the electric locomotive has demonstrated its ability as applying to passenger, freight or switching movement, to outclass the steam locomotive in capacity and control.

WM. S. MURRAY, *Chairman.*

DRYING FLOODED ELECTRICAL EQUIPMENT

A description is given of the methods employed to dry out an electric generator, switchboard and motors which had been under water for more than a week in a flooded basement, the water being contaminated with sewage and sludge.

A corrugated sheet iron house was built round the generator and engine, and two wood-burning stoves were placed inside this housing. A temperature of about 90 deg. cent. was maintained for five days and nights, by which time the generator was fairly dry except for moisture inside the V-rings of the commutator. This moisture was removed by heating the commutator itself, the generator being run with the shunt field disconnected and the armature short-circuited through the series winding. This stage in the process occupied a day and a half. The switchboard instruments were returned to the maker. (K. A. Reed, *Power*, Feb. 17, 1920. 3½ cols., 2 figs.)—*The Technical Review.*