of testing lamps for these qualities. By charts of light distribution he showed the differences between various forms of filament. Efficiencies in lamps are of three standards, 3.1, 3.5, and 4 w.p.c. Where power is cheap, a low efficiency lamp will bring the light cost to a minimum, but where dear, the high efficiency lamp is the cheapest in the end. There comes a time in the life of a lamp when it should be "Oslerized," for, though it may go on giving light, its useful days are ended. The efficiency goes down with age, and the time comes when a 16 c.p. lamp consumes 6 watts and gives only 8 candle power. According to the best usage at present, a lamp should be retired when its candle power becomes 80 per cent. of its original power; that is, 12.8 c.p. for a 16 c.p. lamp. The life of a lamp is not affected by the number of times it is turned on or off, or by alternating current as opposed to direct current, or by the number of frequencies in the former; it is affected by the candle power of the lamp, by the efficiency, and by the voltage, because these are the factors which, if changed one way or the other, alter the diameter of the filament. Troubles are usually in the form of burn-outs. From an inspection of the lamp you can usually locate the trouble. Examine the ends of the broken filament; if they are pointed and a dull black in color the lamp did burn out; if not, it was broken. The two common causes of a burn-out are poor vacuum and high voltage. The vacuum may be roughly tested by observing the vibration of the filament in the bulb. If it vibrates freely, the vacuum is good; if it comes quickly to rest, the vacuum is faulty. High voltage is the most prolific source of trouble, and to locate this the lines must be gone over with a meter at all times of load. Mr. Lambe strongly advised the free renewal system for light companies, as this keeps the service good, and the customers contented, and accounts are cheerfully paid. At the close of his paper, Mr. Lambe exhibited a tantalum lamp, the new type which is just now arousing a great deal of interest in Germany. The filament is composed of tantalum, and the particular point about the lamp is its high efficiency, about two watts per candle. Tantalum increases in resistance with heat, and this should make the lamp less susceptible to high voltage than the carbon lamp.

The question of the change of lamp bases to Edison type called out some questions and remarks. It was generally conceded that this was a matter of great convenience to the manufacturer, and the consumer should fall into line, especially as the introduction of the adapter made the course comparatively easy. Said Vice-President Wright on this point: "I always thought one type was as good as the other, and better; and I would just as soon have one as the other, and rather."

When the convention assembled the second morning, A. L. Mudge read a paper on the "Operation of Alternators in Parallel." The problem of parallel operation is largely one of the regulation of the prime movers—a mechanical, not an electrical problem. At the same time there are certain electrical requirements in the generators. They must have practically the same wave form, they must have the same frequency, the same terminal voltage, and they must be in synchronism. With prime movers of uniform torque, such as water wheels, steam turbines, etc., the question of parallel operation is a very simple one as regards uniform angular velocity. Division of load between alternators depends entirely upon the prime movers; two alternators belted to the same shaft will run satisfactorily in parallel if pulley dimensions are such as to make the frequencies exactly the same, and the tensions on the belts are the same. An inequality of belt tension, however, will divide the load unevenly. Synchronizing connections were treated of by Mr. Mudge, and methods of testing described Several miscellaneous points connected with the subject brought this instructive paper to a close.

Some discussion followed, which brought out the point that the difficulties of parallelism are exaggerated, and that the question largely depends on whether the machine is direct connected or belt driven, whether it is driven from an engine with a single crank or two cranks, and on the nature of the governor.

H. A. Burson, of Allis-Chalmers-Bullock, Limited, discussed the Polyphase Induction Motor. Stepping to the blackboard, Mr. Burson quickly sketched the Behrend circle diagram of the induction motor, and using this as a starting point he opened a discussion. He was bombarded with questions from all sides, but proved himself equal to attack, and he gave satisfactory answers to all questions as to the nature and operation of the induction motor.

For the past three years McGill University has been the scene of some research work which is of great importance and interest to the electrical world, and which is revolutionary in its character. This is an investigation into the Heating of Enclosed Conductors, and in the conclusions which are being reached it is being shown that the present information on the subject is far from complete, and existing tables are consequently quite incorrect. This work was to have been described to the convention by Prof. R. B. Owens, but in his absence Prof. L. A. Herdt discussed the subject. The paradox has been established that the thicker the insulation on a conductor, the more current is required to cause a given rise in temperature. Though this seems absurd at first, it is explained by the fact that the thicker insulation has a greater radiating surface. If two small wires are placed in a small duct they can carry 30 per cent. more current than if they are in a large duct, for in the large duct there is no chance of radiation except where the wires touch the duct, and still air is one of the worst conductors of heat. Consequently, when laying out a system for ten degrees rise, it is necessary to place the wire with as thick insulation as possible, and in as small a conduit as possible. In experiments with bare wire in still air the results tally very well with the tables given in the standard textbooks, but as soon as wires are placed in conduits, the old formulas do not apply at all. So far, these experiments have been conducted for rubber insulation only. Several members of the Association expressed the hope that the work might be carried on to include concentric paper cables and lead-covered wire.

The second afternoon of the convention was spent in sight-seeing. Special cars were in waiting at noon, and carried the party out to Rockfield, where they were received by the Allis-Chalmers-Bullock Co. A splendid luncheon was served in a large tent pitched on the company's grounds, and over two hundred sat down at the tastefully arranged tables. The gratitude of the Association for the hospitality shown was expressed by President Thornton, and replies were made by George Bullock, president of the company, and H. H. Henshaw, the general manager. After the luncheon the party visited the shops, where several large pieces of electrical machinery are now under construction. Demonstrations were made of the operation of coal-cutters, air-compressors, etc.

Time was too short to examine all the interesting things to be seen in and about the shops, for about three o'clock the call, "All aboard!" was heard around the establishment, and the party had to return to the cars. The Association was carried back to the city, to the Maisonneuve substation of the Shawinigan Water and Power Co., where there is installed the largest frequency changer ever built. A description of this equipment was given in a recent issue of "The Canadian Engineer."

In the evening special illuminated cars conveyed the delegates to Electric Park, where a smoking concert was held, about fifteen artists having been brought from New York for the occasion. The entertainment went merrily on till the "wee sma' hours," and it may be remarked in passing that the ten o'clock session of next morning did not assemble till about eleven.

Friday morning was devoted to two papers on "Isolated Plants" and "Steam Economy," respectively. The former, "The Economy of Isolated Plants," was prepared by K. L. Aitken, consulting engineer, of Toronto, and read in the author's absence by J. W. Campbell, of the Canadian General Electric Co. The author assumed the position of the purchaser of light and power who wishes to ascertain whether or not it would be a paying investment to instal a plant of his own. "People have often come to me and asked in a very indignant tone why they have to pay more per