BRINGING MORE DAYLIGHT INTO INDUSTRIAL BUILDINGS.

Dr. George M. Price, writing on "The Importance of Light in Factories," in "The Modern Factory," states: "Light is an essential working condition in all industrial establishments, and is also of paramount influence in the preservation of the health of the workers. There is no condition within industrial establishments to which so little attention is given as proper lighting and illumination. Especially is this the case in many of the factories in the United States. A prominent investigator, who had extensive opportunities to make observations of industrial establishments in Europe as well as in America, states: "I have seen so many mills and other works miserably lighted, that bad light is the most conspicuous and general defect of American factory premises."

"My own investigations for the New York State Factory Commission support this view. In these investigations it was found that 36.7% of the laundries inspected, 49.2% of the candy factories, 48.4% of the printing places, 50% of the chemical establishments, were inadequately lighted. There was hardly a trade investigated without finding a large number of inadequately lighted establishments."

Inadequate and defective lighting of industrial buildings is not confined to the establishments in New York State alone. The same conditions prevail in most sections of the country.

Such conditions as mentioned above are entirely opposed to the laws of health, sanitation and efficiency. Wherever poor lighting conditions prevail, there must be a corresponding loss of efficiency and output both in quality and in quantity. American industry is not using nearly enough daylight and sunlight in its buildings. Every endeavor should be made to use as much as possible of daylight for lighting purposes. To obtain this it is of course necessary that the rays of daylight and sunlight are permitted to enter the interior of the buildings as freely as possible, with the important modification that the direct rays of the sun must be properly diffused to prevent glare and eyestrain. A glass especially made for this purpose is known as Factrolite, and is recommended for the windows of industrial plants. Windows should be kept clean if the maximum amount of daylight is to pass through the glass, but the effort will be well repaid by the benefits secured.

In the presence of poor lighting, we cannot expect men to work with the same enthusiasm as when a well lighted working place has been provided. The physical surroundings have a deep effect upon the sentiments of the employes, and where bad working conditions are allowed to prevail, there is invariably a lessening of morale and satisfaction created thereby. Neglecting to utilize what nature has so bounteously provided, daylight, and which is so essential toward industrial efficiency, we have an instance of wastefulness, but now that the importance of good lighting is becoming recognized, undoubtedly more attention will be given by progressive industrial employers to furnishing the means which are essential for their workers to secure and maintain the efficiency, which counts for so much in the success of any industrial concern in this competitive age.

If you are interested in the distribution of light through Factrolite, we will send you a copy of Laboratory Report—"Factrolited."

MISSISSIPPI WIRE GLASS CO.,
220 Fifth Avenue,
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No. 3.

PROVERBS FOR THE CIVIL ENGINEER

A double track is worth a carload of switch points.

Bad cross hairs corrupt good manners.

Spare the rod and spoil the profile.

There's many a slip twixt the sight and the book.

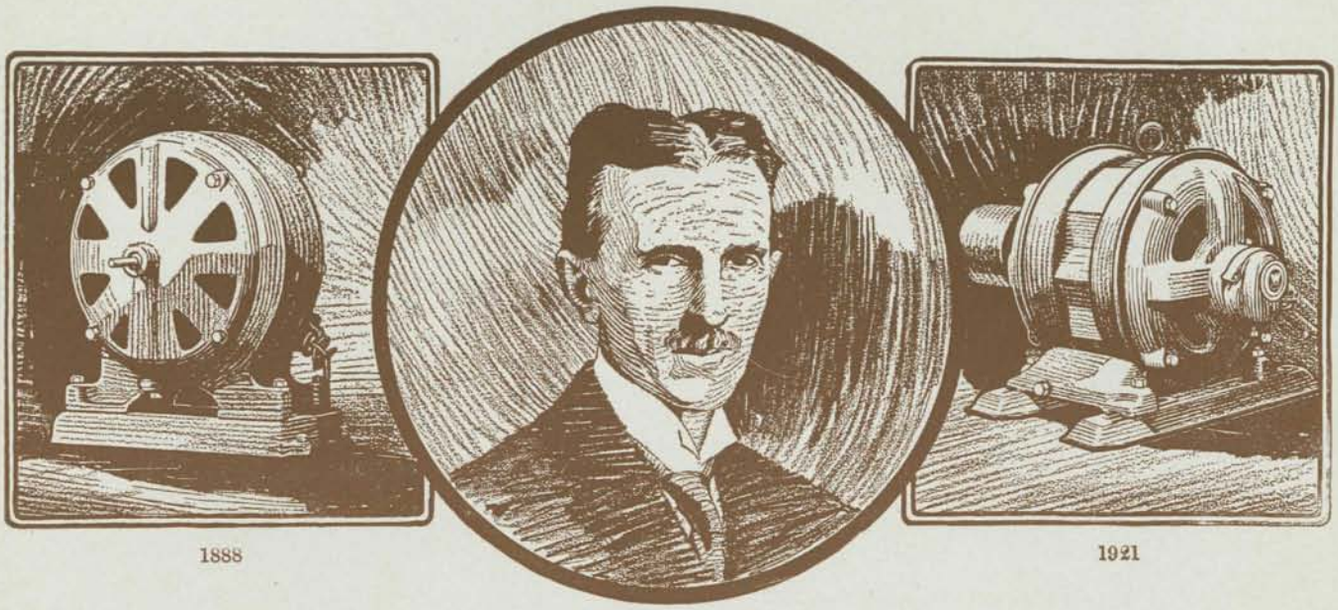
A transitman's wave is as good as his word.

Swift drains the water where the sewer is deep.

Measure in haste and repent in the office.

A steep grade is rather to be chosen than great bridges.

The better the description, the better the deed.



1888 1921

Nikola Tesla

THE NAME of Nikola Tesla will always be associated with the invention and earlier developments of the induction motor. In fact, at one time this type of apparatus was known almost exclusively as the "Tesla" motor.

Tesla devised this motor back near the beginnings of the electrical business, when practically everything was built by "cut and try" methods, and none of the accurate analytical processes of later days had been developed. It may be said broadly that Tesla knew two fundamental facts—first, that if a magnet were moved across a sheet of conducting metal, it would tend to drag this metal along; and,—second, that the *effects* of such a moving magnet could be produced by suitably disposed polyphase currents acting on a *stationary* magnetic structure.

Perhaps others, at that time, also knew these two facts, but if so, apparently they knew them only as two isolated facts. Tesla considered them *in combination* and the result was the Tesla motor, or what is now known broadly as the "induction motor." These two facts, in combination, represent a fundamental conception, and all of the many millions of horsepower of induction motors in use today throughout the world, are based upon these two fundamentals.

Naturally, Westinghouse, having fought single handed to advance the alternating current system, was supremely interested in the new type of motor. What if the new motor did require polyphase circuits, while all existing circuits were single phase? What if it did require lower frequency than any existing commercial circuits? These were merely details of the future universal alternating system. The important thing was to obtain an ideally simple type of alternating current motor, which Tesla's invention offered. Tesla furnished the fundamental idea.

He and his associates, working for Mr. Westinghouse, proved that thoroughly operative induction motors could be built, provided suitable frequencies and phases were available. What matter if they did not produce an operative commercial system at the time? What matter if it needed the powerful analytical engineers of later date to bring the system to a truly practicable stage—men with intimate constructive knowledge of magnetic circuits—men on intimate terms with reactive coefficients and other magnetic attributes totally unknown to Tesla and his coworkers? In time the motor was made commercial, and it has been a tremendous factor in revolutionizing the electrical industry.

Probably no one electrical device has had more high-power analytical and mathematical ability expended upon it than the induction motor. The practical result has been one of the simplest and most effective types of power machinery in use today. Thus Tesla's fundamental ideas and Westinghouse's foresight have led to an enormous advance in the world's development.

Westinghouse

WESTINGHOUSE ELECTRIC

What Is a Vacuum Furnace?

IN an ordinary furnace materials burn or combine with the oxygen of the air. Melt zinc, cadmium, or lead in an ordinary furnace and a scum of "dross" appears, an impurity formed by the oxygen. You see it in the lead pots that plumbers use.

In a vacuum furnace, on the contrary, the air is pumped out so that the heated object cannot combine with oxygen. Therefore in the vacuum furnace impurities are not formed.

Clearly, the chemical processes that take place in the two types are different, and the difference is important. Copper, for instance, if impure, loses in electrical conductivity. Vacuum-furnace copper is pure.

So the vacuum furnace has opened up a whole new world of chemical investigation. The Research Laboratories of the General Electric Company have been exploring this new world solely to find out the possibilities under a new series of conditions.

Yet there have followed practical results highly important to industry. The absence of oxidation, for instance, has enabled chemists to combine metals to form new alloys heretofore impossible. Indeed, the vacuum furnace has stimulated the study of metallurgical processes and has become indispensable to chemists responsible for production of metals in quantities.

And this is the result of scientific research.

Discover new facts, add to the sum total of human knowledge, and sooner or later, in many unexpected ways, practical results will follow.

General Electric Company

General Office — Schenectady, N. Y.

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