

ON NIKOLA TESLA

Being yet another admirer of Nikola Tesla, I take your editor's comment in the June 1982 issue of **Radio-Electronics** as an open invitation to provide factual information missing in Mr. Vince Marasco's letter.

A native of Yugoslavia, Nikola Tesla (1856-1943) came to the United States of America in 1884, where his many inventions, covered by more than 700 patents, came to fruition in such diverse fields as electrical-energy processing, thermodynamics, telegraphy, radio, radio astronomy, aviation, physics, optics, mathematics, and chemistry. Here only a few will be highlighted, which are indeed in everyday use at home or at work.

Tesla invented the modern system of polyphase AC currents. Today, that system is still unsurpassed in its efficient and economic generation, transmission, and usage of virtually all available electrical power, and is the

single most important factor is the widespread use of electrical energy as we know it now. To make the transmitted polyphase currents perform mechanical work, he invented a revolutionary polyphase AC motor, which is by far superior to the conventional DC commutator motor. The mechanical commutators, and the brushes that wear out and require continuous maintenance, are eliminated. The rotating action is obtained through his polyphase stator windings, which generate a rotating magnetic field, inducing currents in shorted turn rotor windings, hence producing torque and rotation.

In the days of the wars of currents, with Tesla being the proponent of his new AC polyphase power system and AC motor, and Edison backing DC power generation and transmission, and DC motors, the "Tesla motor", as it was known, was blamed by his opponents for "100 evils." Later, after it became the workhorse of industry, with today's

estimates putting 90% of all industrial power in factories being created by using his motor, its name was changed to the mundane AC induction squirrel cage motor. It is also relatively little known that the Westinghouse Electric Company was born and built just on that small subset of Tesla's patents and inventions. That company had followed Edison and the DC approach, at first; later, it turned to follow Tesla's AC direction.

It is ironic that readers of **Radio-Electronics** magazine may be unfamiliar with another major contribution of Tesla's—the present-day radio. In 1893, in a lecture on high-frequency, high-voltage phenomena (given at St. Louis), Tesla demonstrated the first system for radio transmission, complete with 5 kVA transmitter and a receiver with electronic tube detection. Tesla's patents and priority over Marconi in wireless transmission were finally and belatedly established in the early 1960's by the United States Supreme

Court. Tesla even went one step further in experimenting not only with transmission of signals, but of high power as well. His high-frequency, high-power experiments at Colorado Springs in 1893 still fascinate present-day scientists.

Despite all of that, and other pioneering work, Tesla obtained very little recognition in the USA with (ironically) the Edison Medal being his highest honor. Nevertheless, the International Electrotechnical Commission in Munich, on July 7, 1956 (100 years after Tesla's birth), bestowed upon him one of the highest forms of recognition that a scientist can achieve. A unit of magnetic induction in the international system of units bears the name *tesla*, joining such historical electrical units as the farad, volt, ampere, and ohm.

Let me quote one of his contemporaries, Mr. Behrend, who spoke these words when asking Tesla to accept the Edison medal: "Were we to seize and eliminate from our industrial world the results of Mr. Tesla's work, the wheels of industry would cease to turn, our electric cars and trains would stop, our towns would be dark, our mills would be dead and idle...His name marks an epoch in the advance of electrical science. From that work has sprung a revolution."

For those of your readers who want to learn more about the accomplishments of Tesla, I recommend two books: the classical work, *Prodigal Genius—The Life of Nikola Tesla—Inventor Extraordinary*, by John O'Neill, and the recent work, *Tesla—Man Out Of Time*, by Margaret Cheney. (See page 158, **Radio-Electronics**, October 1982.)

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