

TESLA'S DEATH RAY
A RECONSTRUCTIVE POSTULATE
BY TIMOTHY VENTURA

INTRODUCTION:

Nikola Tesla, the practical inventor of the alternating current, the Tesla-Coil, and over 700 other patented inventions, is also known for his assertion to have invented a method of projecting an extremely potent "death-ray" through space to destroy predetermined targets.

The July 11, 1934 issue of the New York Times ran a story concerning this supposed invention of his, which he claimed to be powerful enough to destroy, "10,000 planes 250 miles away...without a trace."

"My apparatus projects particles which may be relatively large or of microscopic dimensions, enabling us to convey to a small area at a great distance trillions of times more energy than is possible with rays of any kind. Many thousands of horsepower can thus be transmitted by a stream thinner than a hair, so that nothing can resist."

"Teleforce, said Tesla, was based on four new inventions, of which two had already been tested: 1. a method of producing rays on the free air without a vacuum; 2. a method of producing 'very great electrical force'; 3. a method of amplifying this force; 4. a new method for producing 'tremendous electrical propelling force.'"

EXAMINATION:

Several aspects of the "Death Ray" have intrigued modern researchers--one of the most important of those being Tesla's expertise in fields related to his description of the device. When Tesla's experimentation with High Voltage Alternating Currents is examined, as well as his unique approach to visualizing the way in which electricity is manipulated, a picture of expertise emerges that tends to lend credence to his "Death Ray" device.

Many engineers have speculated that the "Death Ray" was actually a variation of the more commonly known "particle-beam"--a weapon popular in the annals of science fiction. Particle beams--steady streams of electrons, protons, neutrons, or ions--are a product of particle accelerators, and to date, there has been no known way to use a particle beam as a weapon. Particle beams do have extremely destructive capabilities, however, the apparatus now used to generate them requires accelerators miles in diameter using billions of Joules of energy. Although Tesla never claimed to have invented a "portable model", there are photos of him with a scale model of his weapon, igniting gunpowder from a distance of a few feet. Particle beams are even more inefficient when used in an atmosphere, which tends to scatter and absorb the beam to

such a great extent as to render it virtually useless--thus, a "hair-thin" beam would be a seeming mechanical impossibility.

THEORETICAL CONSIDERATIONS:

In a hopefully accurate approximation of the thought processes that occupied Tesla while designing this device, one must fully consider that nearly all of his work revolved around High Voltage Alternating Currents. In fact, his death ray is publicized as being based on his designs for the wireless electrical transmission of power. While based on undisputable scientific principles, most of Tesla's work fell in between the areas of physics and engineering. Hence, when Tesla wanted to transmit a focussed beam of energy, his thought processes might have gone as thus:

There are three means (if not more) of directly transmitting electrical energy from one location to a remote location in a "wireless" fashion: 1. The broadcasting of Electromagnetic waves from point A to point B--where those waves excite atoms to produce electricity. This method is feasible for power transmission and weapons applications, but unfortunately is impractical to technology except in the microwave region of the spectrum. Tesla's equipment, being primarily alternator-based and not using any solid-state components, could not have reached a high enough frequency by orders of magnitude to transmit microwave-band energy. 2. Direct-current transmission of energy from source to target. This is the principle of particle accelerators--the electrons or other particles are moved in a linear fashion through the accelerator, to be then directed at a target. This method of wireless transmission was also impractical to Tesla, because it requires a mechanical arrangement that is monumentally expensive, complicated, and energy-consumptive, and produces a beam that is unfocusable, easily distorted and dissipated, and has an effective distance measured in feet, not miles. 3. Alternating current transmission of power--the longitudinal wave interference device. An alternating current at a high voltage--such as those that Tesla worked with for his entire career--could be a means of providing transmission of power between remote locations with substantially smaller losses. Alternating atmospheric currents, however, have several drawbacks--including the fact that they are inherently unfocussed in nature. The possible solutions to this problem will be discussed below.

There are a few various possibilities for the transmission of power, and Tesla probably entertained them all. The real problem, of course, was simply "how to get electricity to point B". Tesla wouldn't have even cared if it came from point A, which brings two choices to mind. Firstly, the transmission of power from Point A to Point B requires a few things. Since electricity moves from a point with a high potential to a point with a low (or opposite) potential, it was in Tesla's best interests to have the "target"

Point B at a lower electrical potential than the surrounding environment--otherwise, the electrons would get "lost" after only a few feet. Tesla would have considered this potential difference to be the only thing of any import to the transmission of power, and hence, why move the electricity from Point A at all--simply make Point B a lower potential than its surrounding environment.

Tesla would have wanted a device that could create a "positive" potential (at least temporarily) around the target object. Once that target was "ionized" to a high enough voltage, electrons from the surrounding environment would simply flood into the target due to electrostatic attraction. Once he had created a device that could positively ionize an object at a distance, he simply had to arrange a terminal at Point A with a high opposite potential to supply electrons, which would then literally be pulled to the target source. Apparently, the easiest way to do this also tends to focus the beam of electrons, creating a directed bolt of lightning from A to B.

THE WEAPON:

Tesla's Death Ray lies somewhere in between wave mechanics and electrical engineering--and is thus easily missed by the increasingly specialized numbers of scientists and technicians in the world today. He basically used A Fresnel Lens to focus a "Longitudinal-Wave", hence creating a focussed electrostatic potential at the target. This "fresnel" effect is also responsible for the focussing of the subsequent electron beam from A to B.

Tesla concept used longitudinal waves--which are not really waves at all. Longitudinal Waves correspond to variations in pressure (such as acoustics), and in electricity, they correspond to variations in electrostatic potential--such as those produced by an AC current "travelling" through the atmosphere. Longitudinal electrical waves can be focused with a Fresnel lens like ordinary waves, meaning that the "wave amplitudes" add at the focal point--Hence, the environment receives a theoretical potential of -15 volts, and the target recieves -30 volts. A multizoned Fresnel Lens would undoubtably increase this focal potential a great deal more than a single zoned lens, but a single-zone lens has an infinite number of focal points at regularly spaced intervals, whereas a multizoned lens has only one...

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