AWESOME stories

MEET GALVANI and VOLTA

Luigi Galvani, who experimented with frog legs, used electrostatic generators and thunderstorms to obtain electric current for his experiments. During storms, Galvani made sure the frog-leg muscles were in contact with an iron fence while the frog-leg nerves were in contact with a brass hook. Lightning flashes caused the leg muscles to contract. Then, in 1786, Galvani realized that if the iron (from the fence) and the brass (from the hook) were in contact, the frogs' muscles would contract even without the presence of lightning. Image online via "The Worlds of David Darling."

Two Italian academics, who helped propel the world into the modern age, were working in, or near, Bologna in the late-18th century. At the time, Bologna was part of the Papal States (meaning the town was effectively ruled by the Catholic Church).

Luigi Galvani (in Bologna) disagreed with theories posed by Alessandro Volta (in Pavia, about 150 miles from Bologna). The men could not have been more different as they thought about science, but both were fascinated by electricity.

Volta believed in rationality. Scientific truth, he thought, should always prevail over religious dogma.

Galvani became attracted to the use of electricity during medical treatments. It was used, for example, to electrically stimulate the muscles of a paralyzed man during 1759. A contemporary report relates how the stimulus impacted the patient.

The man's body responded to the electrical stimuli. Galvani believed this happened because the human body works with animal electricity, in fluid form, flowing from the brain through the nerves into the muscles where electricity produces motion. His grizzly experiments seemed to prove that he was right.

In his experiments with frogs, Galvani used Hauksbee's electrostatic generator. He connected the charge from the machine so it would travel, via copper wire, to a nerve just above a frog's leg.

Just as Galvani expected, the frog's leg twitched. Galvani believed there is a kind of electricity which is intrinsic to living human beings.

For Volta, a rational but also a religious man, the mere idea of animal-electricity sounded like magic. He thought such an idea had no place in scientific inquiry. The leg of a frog moved, asserted Volta, not because of animal electricity *inside* the frog but because of electricity (artificially produced and applied) *outside* the frog.

Galvani, on the other hand, could not believe what Volta was saying. For him, Volta's ideas seemed incredibly short-sighted (and against the weight of objective evidence).

The debate, between the two men, was a significant one and, given the time frame, had religious overtones. Could the type of electricity which man produced (artificially) be the same as God produced (naturally)?

Galvani answered that question "yes."

Volta answered that question "no," believing that to even assert such a thing bordered on blasphemy.

Who was right?

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Discovering Electricity - Galvani and Volta

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