

to subject the arc to the action of a magnetic field in order to produce oscillations. In fact, the oscillations obtained by simply immersing two copper rods in water and starting an arc between them were much more powerful than those produced by a single arc in air, and the stability of the wet arc left nothing to be desired.

This discovery so discouraged Professor Birkeland from pursuing his original line of investigations that the experiments were dropped.

ANDERS BULL

CHICAGO, ILL.,  
October 25, 1920

#### ROMANCING IN SCIENCE

TO THE EDITOR OF SCIENCE: "O tempus! O mores!" To one who has used Professor Cajori's book with some confidence, his reply<sup>1</sup> to Dr. Partridge is disturbing. Dr. Partridge concluded<sup>2</sup> that we do not know exactly what experiment Galileo performed from the leaning tower of Pisa. Professor Cajori in reply offers data that (apparently unintentionally) substantiate Dr. Partridge's statement, but he says that it appears to him *too sweeping*.

In Professor Cajori's "History of Physics" (p. 32) the following detailed account occurs:

The first experiments, which Galileo made while he was a young professor at Pisa, were decidedly dramatic. At that time the doctrine that the rate at which a body falls depends upon its weight was generally accepted as true, merely on the authority of Aristotle. It was even held that the acceleration varies as the weight. Prior to Galileo it did not occur to any one actually to try the experiment. The young professor's tests went contrary to the doctrine held for two thousand years. Allowing for the resistance of the air, he found that all bodies fell at the same rate, and that the distance passed over varied as the square of the time. With all the enthusiasm, courage and imprudence of youth, the experimenter proclaimed that Aristotle, at that time believed by nearly every one to be verbally inspired, was wrong. Galileo met with opposition, but he decided to give his opponents ocular proof. It seems almost as if

nature had resorted to an extraordinary freak to furnish Galileo at this critical moment in the history of science, with an unusual convenience for his public demonstration. Yonder tower of Pisa had bent over to facilitate experimentation, from its top, on falling bodies. One morning, before the assembled university, he ascended the leaning tower, and allowed a one pound shot and a one hundred pound shot to fall together. The multitude saw the balls start together, fall together and heard them strike the ground together. Some were convinced, others returned to their rooms, consulted Aristotle, and, distrusting the evidence of their senses, declared continued allegiance to his doctrine.

In his reply to Dr. Partridge, Professor Cajori gives "the historical data" and says that from them "it follows that Galileo dropped different weights of a variety of materials and noticed which of them fell faster."

Now, Mr. Editor, from what data does the above quoted thrilling account follow? And from what data and by what processes may other parts of history be reconstructed by scientists? And from what data must it follow in your readers' minds that Dr. Partridge is the scientist guilty of a "declaration" that is "too sweeping"? Recently it cost me many hours of painstaking experimentation to prove that certain improbable statements made in print by a scientist were directly contrary to fact; when the results of the investigation were sent to him, he replied that his had been *merely casual remarks*! Your correspondent happened to see the following in his Montaigne this morning, *Fortis imaginatio generat casum*—there translated, "A strong imagination begetteth chance."

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#### A THRICE TOLD TALE

THE conversation which Professor Campbell describes, in a recent number of SCIENCE, as taking place at the eyepiece of the Lick telescope in September, 1912, prompts me to quote the closing paragraph of my article on the mercury telescope which appeared in the *Scientific American* for March 27, 1909.

<sup>1</sup> SCIENCE, October 29, 1920.

<sup>2</sup> SCIENCE, September 17, 1920.