

Isaac Newton was brilliant except when he was not **FREE**

James M. Kent



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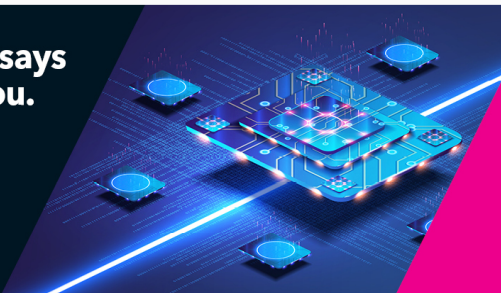


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extra desk in my office. He was a friendly and soft-spoken man. One day I came into the office, said hello, and sat down at my desk, with my back to him. He picked up the telephone and tapped a few numbers, and I heard one side of an interesting conversation:

"Hello, operator? I would like to make telephone call to Soviet Union please.

"My name? Azbel.

"Azbel. A as in asparagus, Z as in Riemann zeta function, B as in Bogoliubov-Born-Green theory, E as in electron-phonon coupling, . . ."

At that point, I was walking out the door, hand over mouth, trying hard to stifle my laughter.

Azbel finished with ". . . and L as in Landau damping."

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Whiting's notes on induction-coil size

The article "Sarah Frances Whiting and the 'photography of the invisible'" (PHYSICS TODAY, August 2020, page 26) was fascinating. It was inspiring to learn of the important contributions she and her group made to x-ray science while using relatively modest laboratory facilities at Wellesley College.

I offer a different interpretation of Whiting's notes on an x-ray photography experiment that was "executed with a 6 in. coil"—the induction coil used to supply high voltage to the Crookes tube that produced the x rays. In the nomenclature of the day, the maximum voltage of an

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induction coil was measured in inches, referring to the maximum length of air-discharge spark it could make, the most reliable way to measure high voltage at the time. A six-inch coil would generate a pulse of about 130 kV. That was a key detail to record because it related directly to the x-ray energy. The coil diameter was much less important.

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Andrew Odlyzko's article "Isaac Newton and the perils of the financial South Sea" (PHYSICS TODAY, July 2020, page 30) is more than just a fascinating read about Newton and financial speculation of the time. It is also, perhaps unintentionally, a commentary on society's assumptions about scientists.

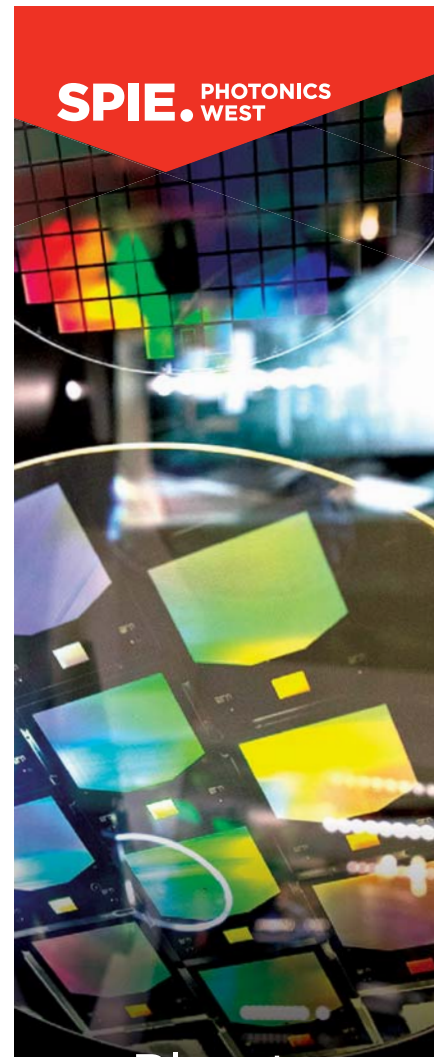
Why would we expect Newton to excel in financial speculation? Because of his mastery of mathematics and complex natural systems and his work at the Royal Mint? Perhaps. Furthermore, as a culture we—and often scientists themselves—assume the portability of scientific wisdom: Because science is hard, scientists are considered to be qualified to master "less hard" nonscientific subjects. I have worked in communications at scientific and technical organizations for decades, and it is not uncommon to find PhDs who assume—and even say—"I could do your job better than you. I just don't have time." An exceptional few are good communicators to anyone outside their field; the vast majority are tolerable to dreadful despite their conviction otherwise.

Of course Newton would flunk the test. He had no financial models at the time, and even if he did, the motion of markets owes more to the unquantifiable forces of expectation and fear than to the quantifiable forces of nature that Newton knew so well.

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