

The Third Side of the Coin: Merry Newtonmas!

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Sir Isaac Newton was born on Christmas Day in 1642. He may have been the greatest scientist in human history. His image appears on coins and bank notes, which is appropriate since he was Master of the Mint.

Alone, any of Newton's achievements would have made his mark in history. Together, they encompass not just what we know about the physical world, but how we know it.

Newton is best remembered for his Law of Gravity. He also showed that white light is composed of colors. He built the first reflecting telescope. He demonstrated three fundamental laws of motion. He also invented the calculus. Among his lesser victories, he demonstrated vector arithmetic, he delivered an algorithm for conveniently computing square roots, and he proved the Binomial Theorem.

It can be difficult to grasp the magnitude of Newton's work. His Principia Mathematica is the basis for all physical science and engineering. Without this understanding, we would have none of the machinery we take for granted. Civil, mechanical, and electrical engineering, statistical mechanics, thermodynamics, even quantum mechanics and relativity, derive directly his work. For these reasons and more, the English poet, Alexander Pope wrote this epigram:

"Nature and Nature's laws lay hid in night:
God said, let Newton be! and all was light."

Famous in old age, the English crown turned to him to save the Royal Mint. Even when they were not corrupt -- which they usually were -- the Mint officials were unable to solve the basic problem of creating and maintaining a system of money that worked. A stern Protestant, deeply religious, and moralistic in the extreme, Newton cleared out the criminal element and gave England a reliable monetary system.

Numismatists know a series of tokens from Middlesex, England, struck in 1793, that celebrate Sir Isaac Newton. From 1978 to 1985, the one pound notes of the Bank of England featured Newton on the back, holding a copy of his monumental book, Principia Mathematica, turned to the page that demonstrates the elliptical movement of the planets. The front of the note includes the elements from the token of 1793: the caduceus, an olive branch, and a cornucopia.