

Napier

Many of the fields in which numerical calculations are important, such as astronomy, navigation, trade, engineering, and war, made ever-increasing demands that these computations be performed more quickly and accurately. These increasing demands were met successively by four remarkable inventions: the Hindu-Arabic notation, decimal fractions, logarithms, and the modern computing machines. It is now time to consider the third of these great labor-saving devices, the invention of logarithms by John Napier in the early seventeenth century.

John Napier (1550-1617), who was born when his father was only sixteen years of age, lived most of his life at the imposing family estate of Merchiston Castle, near Edinburgh, Scotland, and expended much of his energies in the political and religious controversies of his day. He was violently anti-Catholic and championed the causes of John Knox and James I. In 1593, he published a bitter and widely read attack on the Church of Rome entitled *A Plaine Discouery of the Whole Reuelation of Saint Iohn*, in which he endeavored to prove that the Pope was the Antichrist and that the Creator proposed to end the world in the years between 1688 and 1700. The book ran through twenty-one editions, at least ten of them during the author's lifetime, and Napier sincerely believed that his reputation with posterity would rest upon this book.

Napier also wrote prophetically of various infernal war engines, accompanying his writings with plans and diagrams. He predicted the future would develop a piece of artillery that could «clear a field of four miles circumference of all living creatures exceeding a foot of height», that it would produce «devices for sayling under water», and that it would create a chariot with «a living mouth of mettle» that would «scatter destruction on all sides». In World War 1, these were realized as the machine gun, the submarine, and the army tank, respectively.

It is no wonder that Napier's remarkable ingenuity and imagination led some to believe he was mentally unbalanced and others to regard him as a dealer in the black art. Many stories, probably unfounded, are told in support of these views. Once he announced that his coal-black rooster would identify for him which of his servants was stealing from him. The servants were sent one by one into

a darkened room with instructions to pat the rooster on the back. Unknown to the servants, Napier had coated the bird's back with lampblack, and the guilty servant, fearing to touch the rooster, returned with clean hands. There was also the occasion when Napier became annoyed by his neighbor's pigeons eating his grain. He threatened to impound the birds if his neighbor did not restrict their flight. The neighbor, believing the capture of his pigeons to be virtually impossible, told Napier that he was welcome to the birds if he could catch them. The next day, the surprised neighbor observed his pigeons staggering on Napier's lawn with Napier calmly collecting them into a large sack. Napier had rendered the birds drunk by scattering some brandy-soaked peas about his lawn.

As relaxation from his political and religious polemics, Napier amused himself with the study of mathematics and science, with the result that four products of his genius are now recorded in the history of mathematics. These are (1) the invention of logarithms; (2) a clever mnemonic, known as the rule of circular parts, for reproducing the formulas used in solving right spherical triangles; (3) at least two trigonometric formulas of a group of four known as Napier's analogies, useful in the solution of oblique spherical triangles; and (4) the invention of a device, called Napier's rods, or Napier's bones, used for mechanically multiplying, dividing, and taking square roots of numbers. We turn now to the first, and most remarkable, of these four contributions.



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