# Thomas Bayes

**Thomas Bayes**, (born 1702, London, England—died April 17, 1761, Tunbridge Wells, Kent), English Nonconformist theologian and mathematician who was the first to use probability inductively and who established a mathematical basis for probability inference (a means of calculating, from the frequency with which an event has occurred in prior trials, the probability that it will occur in future trials). *See* probability theory: Bayes's theorem.

Bayes set down his findings on probability in "Essay Towards Solving a Problem in the Doctrine of Chances" (1763), published posthumously in the *Philosophical Transactions* of the Royal Society. That work became the basis of a statistical technique, now called Bayesian estimation, for calculating the probability of the validity of a proposition on the basis of a prior estimate of its probability and new relevant evidence. Disadvantages of the method—pointed out by later statisticians—include the different ways of assigning prior distributions of parameters and the possible sensitivity of conclusions to the choice of distributions.

The only works that Bayes is known to have published in his lifetime are *Divine Benevolence; or, An Attempt to Prove That the Principal End of the Divine Providence and Government Is the Happiness of His Creatures* (1731) and *An Introduction to the Doctrine of Fluxions, and a Defence of the Mathematicians Against the Objections of the Author of The Analyst* (1736), which was published anonymously and which countered the attacks by Bishop George Berkeley on the logical foundations of Sir Isaac Newton's calculus.

Bayes was elected a fellow of the Royal Society in 1742.

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