GEORGE GREEN, APPLIED MATHEMATICIAN

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Consider the typical characteristics of the lives of many of the mathematicians we now consider historically significant: having educated parents, attending the best schools, winning a mathematical contest, or holding an endowed chair at a university. In contrast, there is George Green, the man for whom Green's Theorem of Multivariate Calculus is named. He made revolutionary advances in mathematics despite lacking all the above named academic advantages. The July 1993 bicentennial of Green's birth was the occasion of several events celebrating his life and work. In fact, only recently have the fascinating details of that life been fully understood. This short summary is offered with the aim of lifting some of the obscurity surrounding Green; much more information is available in the references.

George Green, Jr. was born into the family of a Nottingham, England baker and his wife. His schooling was minimal — lasting only about 14 months, beginning at age 8. In 1807 the senior George Green built a 50 foot tall brick windmill in Sneinton, just outside of Nottingham, to insure a more reliable source of flour for baking. George, Jr. worked in the mill from his fourteenth to his fortieth year and studied mathematics and physics in his spare time. Meanwhile, he became close to Jane Smith, the daughter of the man hired to operate the mill. Their relationship led to a total of seven children, but they never married.

Green's greatest mathematical work was his first, *An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism.* He published this privately in 1828 due to the fact that he was a miller — a common man, and not a member of any academic organization. In this work we find the proof of Green's Identity in three dimensions (but not the two-dimensional version in calculus texts!), the first use of the term "potential function," a discussion of the existence and uses of Green's functions, and extensive use of the idea of reciprocity. All of these have become important tools in the field now known as Potential Theory.

Unfortunately, the fact that the Essay was published privately meant that the learned societies of the day had no reliable way of finding out about it, and it