Gregor Mendel (1822-1884)

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The theories of heredity attributed to Gregor Mendel, based on his work with pea plants, are well known to students of biology. But his work was so brilliant and unprecedented at the time it appeared that it took thirty-four years for the rest of the scientific community to catch up to it. The short monograph, *Experiments with Plant Hybrids*, in which Mendel described how traits were inherited, has become one of the most enduring and influential publications in the history of science.

Mendel, the first person to trace the characteristics of successive generations of a living thing, was not a world-renowned scientist of his day. Rather, he was an Augustinian monk who taught natural science to high school students. He was the second child of Anton and Rosine Mendel, farmers in Brunn, Moravia. Mendel's brilliant performance at school as a youngster encouraged his family to support his pursuit of a higher education, but their resources were limited, so Mendel entered an Augustinian monastery, continuing his education and starting his teaching career.

Mendel's attraction to research was based on his love of nature. He was not only interested in plants, but also in meteorology and theories of evolution. Mendel often wondered how plants obtained atypical characteristics. On one of his frequent walks around the monastery, he found an atypical variety of an ornamental plant. He took it and planted it next to the typical variety. He grew their progeny side by side to see if there would be any approximation of the traits passed on to the next generation. This experiment was "designed to support or to illustrate Lamarck's views concerning the influence of environment upon plants." He found that the plants' respective offspring retained the essential traits of the parents, and therefore were not influenced by the environment. This simple test gave birth to the idea of heredity.

Mendel's research reflected his personality. Once he crossed peas and mice of different varieties "for the fun of the thing," and the phenomena of dominance and segregation "forced themselves upon notice." He saw that the traits were inherited in certain numerical ratios. He then came up with the idea of dominance and segregation of genes and set out to test it in peas. It took seven years to cross and score the plants to the thousand to prove the laws of inheritance! From his studies, Mendel derived certain basic laws of heredity: hereditary factors do not combine, but are passed intact; each member of the parental generation transmits only half of its hereditary factors to each offspring (with certain factors "dominant" over others); and different offspring of the same parents receive different sets of hereditary factors. Mendel's work became the foundation for modern genetics.

The impact of genetic theory is no longer questioned in anyone's mind. Many diseases are known to be inherited, and pedigrees are typically traced to determine the probability of passing along an hereditary disease. Plants are now designed in laboratories to exhibit desired characteristics. The practical results of

Mendel's research has not only changed the way we perceive the world, but also the way we live in it.