Preface

This book is not written by a professional historian but more from the position of an experimental scientist for whom it is important to formulate the right questions, to design experiments that might be expected to answer them, to do experiments that ask the question of what would happen if x, to build a coherent framework of interrelated ideas, to see how they need to be tested, and then what to do with facts that go against them. This book shows how personal relationships help or hinder progress of such a research project.

More than dealing with the results and explanations of science this book deals with the drama of doing science. This often involves the anguish of going up dead-ends by working on wrong ideas and being unable to drop them when the evidence points in another direction. Or coworkers fall out because of rivalries, jealousies, egocentricity, and thwarted ambitions. Methods are used that are too insensitive to give the correct answer but tantalizingly point to a possible solution.

The text deals with historical characters, so the reader has a right to know which parts are biographical. The majority of events described in this book were taken directly from original sources such as autobiographies, letters, diaries, publications by the actual characters, and eyewitness accounts of public meetings, although not always presented in their strict chronological order. I have used the diary extracts mainly to illustrate the text and have not, therefore, included the dates when they were written.

Similar to many eminent Victorians, Charles Darwin, Thomas Huxley, George Romanes, and Francis Galton were very reticent about their personal lives: for example, it is very difficult to find any personal comments about the quarrel between Darwin and Galton as described in Chapter 6 or the dispute between Romanes and Wallace in Epilogue 2. It is impossible to catch the right tone of people one never knew with only incomplete records such as letters and diaries to go on. The closest intimate records I have used are the diaries kept by Galton's wife, his sister Emma Galton, and Charles Darwin's wife; but these in many ways are more interesting for what is omitted than their actual entries. The diaries mainly consist

of brief headings and notes written in shorthand for various topics such as births, marriages, travels, occupations, property, illnesses, and deaths. Darwin, Wallace, and Galton wrote autobiographies, mainly for posterity, and these have been used extensively. The wives of Romanes and Bateson published accounts of their husbands' lives, which have been frequently quoted.

Mendel came from a small farming village in a remote corner of Silesia in Eastern Europe. There are not many accounts of his life there. He took his vows as a monk at the age of 21 years and lived in his monastery until his death in 1884. His social life was considerably restricted. He published at least three scientific papers, known to have written at least ten letters to colleagues (whereas Darwin wrote more than 15000 letters and Galton more than 450), and Mendel went abroad for the first time at the age of 40 to visit London. I have used his standard biography by Iltis (1924) referenced at the end of this book as well as other named texts there for many of the facts; other details come from the Mendel Museum in Brno. In respect for Mendel's ecclesiastical career as an abbot of St. Thomas, Brno I have selected as many chapter headings relating to religious texts as possible to reflect the topic of each chapter.

The story is mainly told through the eyes of Francis Galton (no relation to the author) because he was involved with the key players throughout his long life. He was an exact contemporary of Gregor Mendel both being born in 1822 and lived until 1911, so witnessing the foundations of modern genetics. Galton came under the influence of his cousin Charles Darwin from the start, which affected his ideas on heredity and my book begins at this stage. Galton and Mendel both presented their first observations on heredity in 1865. Galton's paper was titled *Heredity Talent and Character* published in the *Macmillan's Magazine*, and Mendel's was *Experiments in Plant Hybridisation*. Both the titles give a clue to their different approaches to science. The former uses abstract words that are difficult to define such as talent and character, whereas Mendel tells you exactly what he did with plant hybrids—experiments. Comparing Mendel's work with the work of Darwin, Galton, Romanes, and Pearson like this reveals in its true light the genius of Mendel. Mendel unfortunately did not live to see his own work being accepted; he died in 1884. Galton subsequently played a significant role in the progress of genetics and lived to see Mendel's theory firmly established, following the Mendel–Biometrician showdown of 1901 in Cambridge, United Kingdom as described in Chapter 15. He also appears to have recognized how close he had got to Mendel's interpretation with his own studies on plants (the sweet pea) and animals (Basset hounds).

This book would be thus characterized as an account of the investigations by Darwin, Galton, Mendel, Romanes, and others on the nature of heredity in the latter half of the nineteenth century. It is a mixture of the

story of science with a good deal of the methods used to obtain the results of science by observation, experiment, and logic.

The epilogues are much longer than usual and I have included other relevant ideas that do not fall easily into the main text by superscript numbers indicating a short note to be found at the end of this book. The sources of the most of the described events are given in a reference list of books and articles I have consulted at the end. There is also a gene timeline of events taking the reader up-to-date with the discoveries of the double helical structure of DNA, cracking the genetic code, and the completion of the human genome project.

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