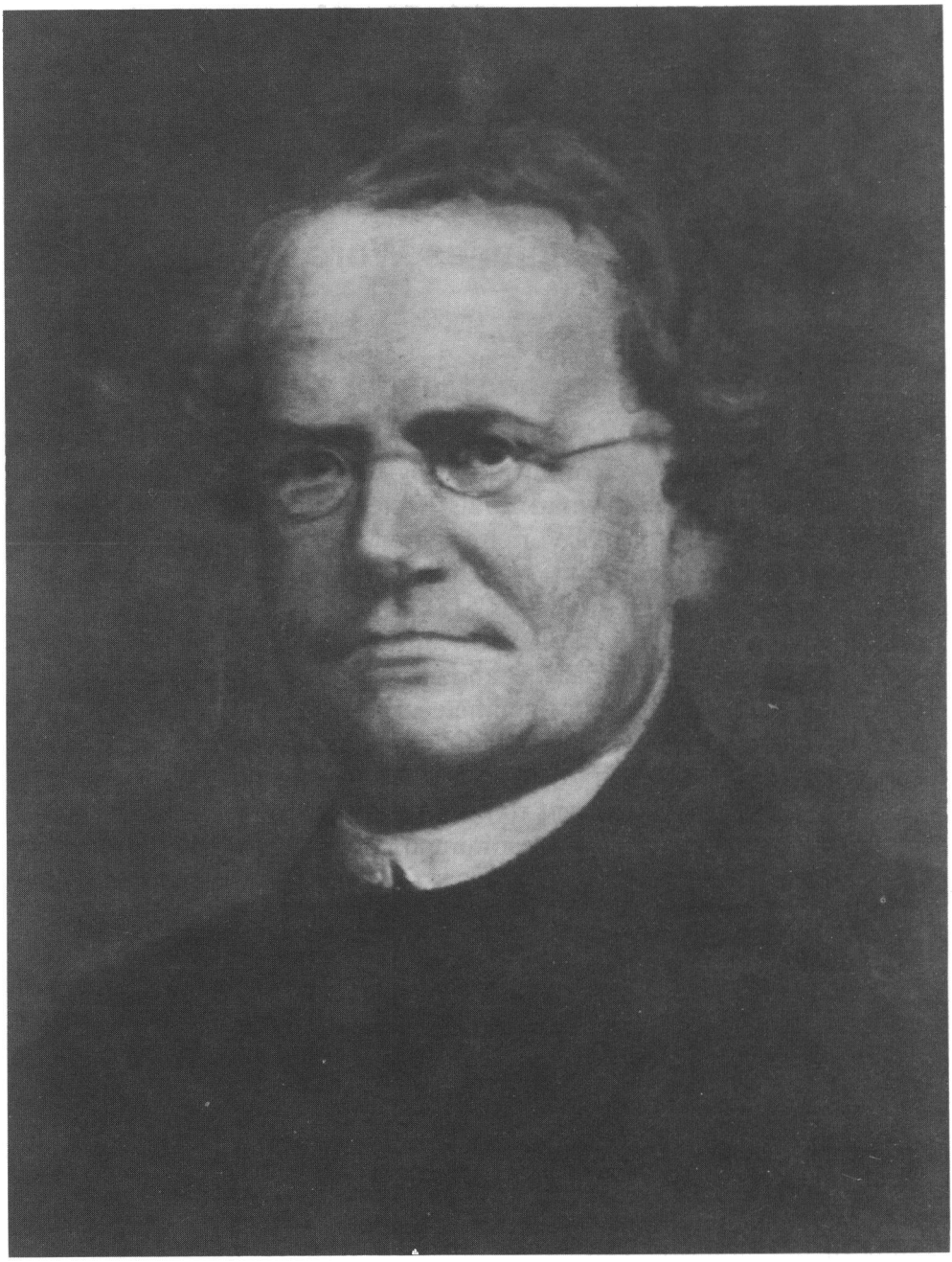
The Strange Coincidence of Gregor Mendel and Louis Pasteur: Both Scientific Geniuses Were Born in 1822

Gregor Mendel

This year, the French are commemorating the centenary of the death of their distinguished countryman Louis Pasteur, chemist and bacteriologist. Yet few people in France or elsewhere will be aware of a fact which I recently discovered: Louis Pasteur and the Czech geneticist Gregor Mendel were born in the same year - 1822. That Pasteur and Mendel are exact contemporaries is a most significant coincidence, for their respective careers symbolize the parallel and contiguous development of medical and genetic knowledge in the nineteenth century. This in turn paved the way for man to discuss, investigate, increase and spread understanding of human reproduction, disease and life-span, and to utilize scientific understanding of these subjects to increase the well-being of mankind in the twentieth century. Indeed, the human relevance of these biomedical discoveries caused them to eclipse those of other branches of knowledge in this century.

In 1843, Gregor Mendel entered the Augustinian monastry at Brünn, Moravia (later Brno, now in the Czech Republic), which at the time was the only monastry in the world to have the status of abbacy. Between 1824 and 1867, the monastry was headed by Abbot Franz Napp, a man whose wide-ranging interests encompassed such diverse subjects as horticulture, and his country's economic and political life, besides the spiritual well-being of his monastry and the local population. In this catholic environment, Mendel was able to conduct his painstaking research into the nature of heredity, using as his subjects the flora and fauna of the monastry garden.

The photograph of Mendel shown here was taken before he became Abbot at Brünn, in a period when as well as carrying out his naturalistic studies, his activities included ministering to the spiritual needs of prisoners in Spielberg prison. As is apparent from his original writings (which I reprinted in 1989), Mendel showed tremendous intellectual rigour in the recording and interpretation of the results of his studies,



Pastel of Gregor Mendel (b. 22 July, 1822), of unknown origin, signed E.L.
(Moravian Museum, Brno)

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never allowing himself to be distracted from his experimental subject - *pisum sativum*. This intellectual rigour enabled Mendel to develop a model of heredity based on the key concepts of dominance, segregation and independence, which were to form the foundation of genetics *ante litteram*.

Mendel's model of heredity, which was opportunely integrated by Hugo de Vries and Thomas Hunt Morgan into the concept of inherited mutations of the genome, at both the chromosomic and molecular levels, is today still considered to be fundamentally valid. In the mid-1960s, Victor McKusich catalogued the human hereditary diseases known at that time, dividing these into three categories: dominant, recessive, and those linked to the X-chromosome. This classification corresponds directly to the basic Mendelian concepts of dominance, segregation and independence. Indeed, the content of the catalogue of human hereditary diseases which McKusich compiled shows the incredibly rapid development of scientific knowledge in the field of genetics. The first catalogue, published in 1966, ran to 700 pages and contained 1487 mutations, while the 11th edition, published in 1994, contains two volumes comprising 4,335 pages, listing 6600 hereditary mutations in man. The title of McKusich's catalogue, *Mendelian Inheritance in Man* is a more apt testament to the importance of Gregor Mendel to contemporary genetics than any epitaph.

Mendel's article "Versuche über Pflanzen Hybriden", published in 1865, which expounded his model of human hereditary, was not followed by further scientific publications. Mendel died in 1882 (eleven years before the death of Pasteur). However, we know that after cultivating peas, Mendel kept bees, and it seems reasonable that he may have supposed that the same laws of heredity which he formulated also applied to the animal world. This hypothesis is being confirmed by modern genetics, which is why I thought it appropriate to give Gregor Mendel's name to the genetics research institute that I founded in Rome. Moreover, the applicability of Mendel's laws of heredity to the animal kingdom is proof of the great genius which the Roman Catholic Church has produced. Morgan, it is worth recalling, was a Fellow of the Pontifical Academy of Sciences.

Luigi Gedda

Contemporary photograph of Louis Pasteur (b. 27 Dec., 1822)
(Musée Pasteur, Paris)

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Louis Pasteur

Louis Pasteur served his country and indeed mankind well. His work laid the foundations of microbiology and immunology, and revolutionized medicine; vaccination and asepsis were born with him. It was he who proved that micro-organisms cause fermentation and disease; he who originated and was the first to use vaccines for rabies, anthrax, and chicken cholera; he who saved the beer, wine and silk industries of France and other countries; he who performed important pioneering work in stereochemistry, and he who invented the process known as pasteurization.

The life and works of this reserved man who was lucky enough to have faith, and for his scientific theories to prove winning ones, form an epic. "The idea of God is a form of infinitity... as long as the mystery of the infinite baffles the human mind, temples will be raised to the cult of the infinite," he said. "In scientific research, luck favours well-prepared souls," Pasteur also commented. Although a century has elapsed since Pasteur's death (in 1895), the reflections of this immortal figure are of perennial relevance. The biological sciences have come a long way since Pasteur, but his memory is preserved in the theoretical framework he bequested, and the results he obtained from his research.

"Modern medicine and what we term public health began with Pasteur," wrote François Jacob, one of the Pasteur Institute's first Nobel prize winners. Public health is now the concern of a network of 23 research centres spread over the continents of Europe, Africa, Asia and Central and South America, 18 of which are Pasteur Institutes.

Since its first Nobel laureate in 1907, the Pasteur Institute in Paris has produced eight Nobel prize winners. These include Emile Metchnicoff for his work on fagocitosis, Jules Bordet for his research on whooping cough, and the pioneers of molecular biology Andre Lwoff, Jacques Monod and François Jacob. Aside from its premier Nobels, the Pasteur Institute is associated with such important names as Leon Calmette and Camille Guerin, famous respectively for having developed the plague and tuberculosis (BCG) vaccines, Emile Roux, renowned for his discovery of the anti-diphtheria serum, and Luc Montaigner, Jean Claude Cherman and Françoise Barr-Sinoussi, who in 1983 isolated the AIDS virus. The achievements of Pasteur's successors, the so-called "Pasteurians" in recent years are too numerous to list here, but Pasteur lives on in the work of those who have followed his example in pushing back the frontiers of science.

Paolo Durand