

Editorial: Gregor Mendel and Twins

There has been, so far, a relation of analogy between Mendel and twins. In fact, since the very beginnings of our studies, we have always stressed the fact that twins should not be considered as a mere curiosity in nature, as an exception to the human reproductive pattern, but rather as the subjects of a branch of Human and Medical Genetics, with characteristics and a methodology of its own. And we have observed that, after all, Gregor Mendel established his laws of heredity using, for his experiments, a *twin* material, that is, those plant polyzygotic twins that are the seeds of *pisum sativum*.

But when, on the 10th of March of 1984, our Institute sponsored a solemn celebration for the centennial of Mendel's death, in the Vatican City and at the presence of Pope John Paul the Second, we had the opportunity to meet a grand-nephew of Gregor Mendel, Father Clemens Richter, himself a member of the same Augustinian Order to which Mendel belonged, and a twin. He payed us a visit at the Mendel Institute and told us that his cotwin had died in the first year of age.

Father Richter, who does not bear the name Mendel since he is an offspring of the Abbott's sister, Veronica, is pictured in Fig. 1 sitting close to the Father General of the Augustinian Order. Both physically and psychologically he seems to resemble his great grand-uncle, although he humorously noted, "To have a famous grand-uncle is a good and honorable thing. And the greater his fame, the warmer its irradiation over the fourth and fifth generation. But then things get complicated if, for that reason, one should expect from Mendel's grand-nephews a genius that is not there".

Father Richter was kind enough to let us have access to his family's pedigree. It is a fairly large pedigree, including a total of 665 individuals in 189 sibships over 9 generations. This has given us the opportunity to make a number of observations, such as an increased sex-ratio (134:100) and an average lifespan of 62.07 ($s = 18.77$), although underreporting and other kinds of ascertainment bias must be taken into account.

More relevant to our interests, however, has been the finding of a small cluster of twin pairs in one branch of Mendel's pedigree (see Fig. 2) – one pair originating from Mendel's sister, Veronica, and two pairs from the Abbott's second cousin, Anton Mendel



Fig. 1 - Gregor Mendel's grandnephew, Father Clemens Richter (right).

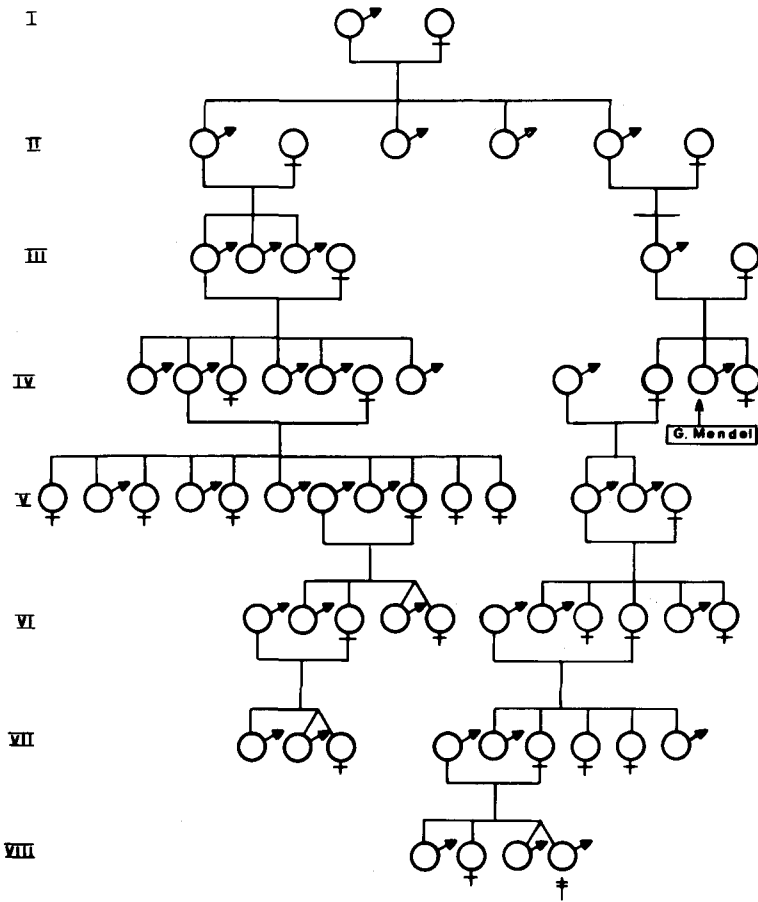


Fig. 2 - Twinning in Gregor Mendel's pedigree.

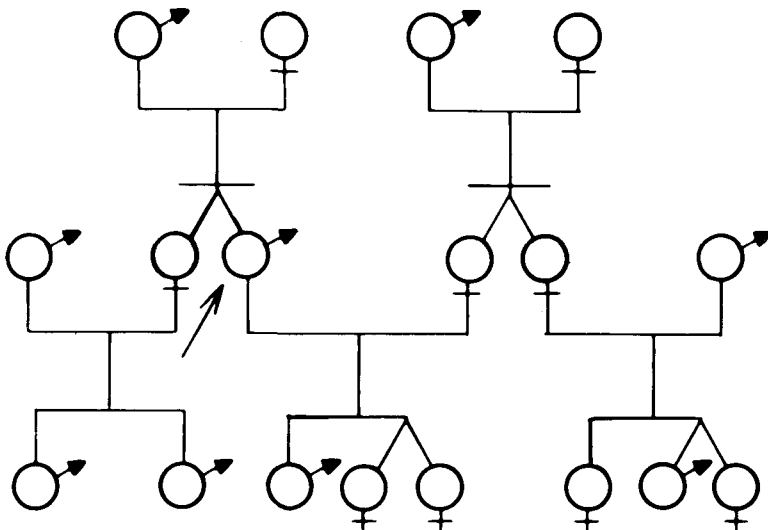


Fig. 3 - Coexistence of DZ and MZ twinning, and of maternal and paternal heredity in the pedigree of a family of Malta.

(b. 29.08.1788, d. 04.04.1830). The latter two pairs are Hermann and Hermine Strodi (b. 14.12.1913) in the sixth generation, and Heinz and Heide Huber (b. 12.04.1944) in the seventh generation. Both pairs are of opposite sex, hence DZ. The twins originated from Mendel's sister Veronica are Clemens and Erich Richter (b. 17.09.1933), of which the latter died at one year of age while the first born became that Father Richter we have had the opportunity to meet.

The relation of Gregor Mendel to twins, from one of simple analogy because of the *pisum* twins he experimented upon, becomes at this point one of actual consanguinity.

The monozygotic process that is experimentally induced by cutting with a glass thread through the median plane of early gastrulae in *Triton* has been extensively studied in the past, also in collaborative studies between the Mendel Institute and the German school (Mangold & Testa 1956). Its exact mechanism is far from clearly understood, but it is known that a late cleavage can give rise to incomplete disjunction and thus to conjoined twinning. Lefthandedness and other laterality inversions in regular MZ twins can perhaps be attributed to somewhat similar causes.

It is also generally accepted, that twinning runs in the families. That is particularly true of DZ twinning (as it seems to apply to Mendel's pedigree) but MZ twinning also appears to be involved, as a large family study recently conducted at the Mendel Institute has indicated (Parisi et al. 1983). Both maternal and paternal factors would seem to play a role, and in both types of twinning. The coexistence of DZ and MZ twinning and of maternal and paternal heredity is also exemplified in the pedigree of a family from Malta that we have recently been able to study (see Fig. 3).

It is to be hoped that the fairly general consensus on the familial incidence of twinning, as now also exemplified by Gregor Mendel's pedigree, will continue to stimulate interest in the elucidation of the actual mechanism(s) involved.

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