

## Galileo's Daughter

By Dava Sobel, Walker & Co. USA, 1999, ISBN: 08027 13432, 448 pages

The Author has made an in depth research about the relationship between a famous father and a faithful daughter. The result is a fascinating book that demonstrates how the sentiments can properly mix with science and how much the love of a daughter can support a man aimed at discovering the Truth. It is, to a certain degree a very precise scientific biography of the Italian Astronomer, Mathematician and Philosopher Galileo Galilei (Pisa 15 February 1564 – Arcetri Florence 8 January 1642). It is also a vivid presentation of the times of the Inquisition and shows the contrasts existing between cardinals appreciative of the sciences and those strictly following the rules of the Holy Office, thus neglecting any scientific evidence that could put in question the content of the Bible.

Virginia, the beloved daughter of Galileo, sent her father a series of letters during the difficult period of his life when he was under the Inquisition's trial. Suor (Nun) Maria Celeste (the religious name of Virginia) was born in 1600 (the same year in which Giordano Bruno, the Italian philosopher, was burned in Rome by the Inquisition) and took vows in the convent of San Matteo d'Arcetri, not far from Bellosguardo where Galileo was living, in 1616. In that year her famous father had published his Treatise on the Tides. He needed the tides movement to reinforce the Copernican theory that the Earth rotates on its axis and travels around the sun every year. The combination of these two Copernican motions accounts for all tides. Hydrographers may be interested in the analysis made by Galileo to justify the tides range differences as a consequence of the basin dimensions and other factors such as the depth of the waters, the shape of the basin etc. But that same year the Copernican theory was examined of a special panel composed by 11 cardinals of the Holy Office: they were unanimous in assessing that the Copernicus theory was not only *formally* heretical but also *foolish and absurd*.

Galileo was admonished and invited to abandon defending this opinion and this he obeyed to avoid a Holy Office trial. Suor Maria Celeste started sending letters to her father in 1616. Letters mainly dealing with her monastic life and several times related to logistics difficulties that were invariably solved by the financial aid promptly provided by her generous father. The letters also dealt with the health of her father who started a long illness series in 1623. In that year Maffeo Cardinal Barberini, a Florentine, became Pope Urban VIII. That was good news for Galileo, who had been known and appreciated by Cardinal Barberini since 1611. Galileo thought that the new pope would cancel the edict of 1616 and went to Rome to visit him in 1624 and had several talks with him in the spring of that year. He was then encouraged to write a book about the *Two chief Systems of the world, Ptolemaic and Copernican*. He did this under the form of a dialogue between three

characters: Salviati and Sagredo (two dead friends of Galileo) and Simplicio (from the Greek philosopher Simplicius). He dedicated the Dialogue to the Grand-Duke of Tuscany Ferdinand II.

Galileo had in fact been since 1610 Chief Mathematician at the University of Pisa and Philosopher and Mathematician to the Grand Duke of Tuscany Cosimo II. Dava Sobel, the Author, here intensifies her research and describes accurately in which way Galileo had the impression that his book could be accepted by the Catholic Church and how, instead, the already printed Dialogue was considered in total contradiction with the holy scripture and how Galileo was submitted to a humiliating trial by the Holy Office of the Inquisition in Rome. The description of the Trial, which took place in Rome in June 1633, is emblematic of the time of the Inquisition for a great philosopher and astronomer (he had discovered the moons of Jupiter in 1610) was treated as if he was an unknown person. He was practically imprisoned while waiting the result of the trial and at the end he was considered *vehemently suspect of heresy* and condemned to *formal imprisonment in this Holy Office at our pleasure*. In addition Galileo (70 years old) had to kneel and to abjure and to promise to:

*"abandon the false opinion that the sun is the centre of the world and immovable and that the Earth is not the centre of the same and that it moves".*

Here the Author recalls that it is often said that as Galileo rose from his knees he muttered *"Eppur si muove"* (but it still moves). Author Sobel does not believe that Galileo said that on that same day. I think instead, knowing the behaviour of the Tuscans, that it could have been possible. The imprisonment of Galilei lasted only some days after which he was transferred to the Tuscan embassy in Rome. But the pope Urban VIII, who had completely changed his attitude towards Galileo, did not want to pardon him and did not want give him the permission to return home. He only consented to his transfer to Siena, where he had to stay with that city's archbishop (who treated him very well) for five months.

Eventually he was permitted to return to Florence in his house in Arcetri (a lovely typical Tuscan locality that deserves a visit). During all this terrible period *Suor Maria Celeste* wrote him a series of tender letters in which all her love and respect for the famous father is shown in various ways. At last they were able to meet when Galileo returned to live at a short walking distance from the Convent of San Matteo. But they only had the possibility to see one each other for a short time as *Suor Maria Celeste* died in Arcetri on 2 April 1634. Her father continued his research and studies until 1642 when he died, totally blind, on 8 January 1642. Only in 1992 Pope John Paul II publicly endorsed Galileo's philosophy after a revision of Galileo affair carried out by a special commission established in 1982.

This story, which I have tried to summarise here, is extremely well narrated providing the human aspect of the relationship between father and daughter. The letters of *Suor Maria Celeste* have guided the Author along the sequence of the events that so harmfully affected the last years of Galileo; the historical reconstruction is precise and easy to be followed. In addition the book is completed by accurate scientific references, reported with clarity but never pedantic. The final is a surprise that I do not want to disclose. In summary a great beautiful book. In which way Galileo provides a good example for hydrographers? What do they have in common? The answer is easy: the desire to discover the truth through a constant verification of the hypothesis.

Book reviewed by Rear Admiral Giuseppe Angrisano