Selected Topics
in History of Science

Women in science (mathematics)

DE2B03   Lecture 6

20 March 2023

Greece

Hypatia of Alexandria (?375-415)

- Daughter of Theon of Alexandria

- Interested in astronomy, astrology, mathematics

- Known because of her death as a martyr

Italy

Maria Gaetana Agnesi (1718-1799)

- Italian, born in Bologna

- Spoke five foreign languages (French, Latin, Greek (classical), German, Spanish)

- Read the works of

  – Pierre de Fermat (1601 or 1607/8-1665)

  – René Descartes (1596-1650)

  – Isaac Newton

  – Marquis de L'Hospital

Maria Gaetana Agnesi (1718-1799)

- Teachers: her own father, Rampinelli (the order of Olivetans / Benedictines

- Translated a textbook for mathematics from English into French

- 1752 – entered nunnery (monastery for women) and ceased to be interested in science

DONNA MARIA GAETANA AGNESI MILANESE

France

Emilie du Chatelet (1706-1748)

- Full name: Gabrielle-Émilie Tonnelat de Breteuil

- Married Marquis du Chatelet (1695)

- Friendship with:

- Voltaire (1694-1778)

- Pierre Louis Moreau Maupertius (1698-1759)

Emilie du Chatelet (1706-1748)

- Exposition of Leibniz's physics:

- *Institutions de Physique (1740)*

- Translation of Newton's work

  Prinicipia mathematica (1769)

- (explained in French not just translated)

Sophie Germain (1776-1831)

- Studied during nights

- 1811: work on mathematical theory of elastic surfaces accepted by the Academy of Science in Paris

- A famous theorem in mathematics: the last theorem of Pierre Fermat --- S. G. proved a special case

Karl Friedrich Gauss (1777-1855)

- summing up numbers from 1 to 50 (or 100) as a school boy

- Sophie Germain corresponded with him under the pseudonym M. Le Blanc

- Gauss supported honorary doctorate for Sophie Germain from the French academy

- Gauss lived in Göttingen, triangulation (cartography)

- Daniel Kehlman: *Measuring the Earth*

Germany

Sophia Kovalevskaya (1850-1891)

- Private teachers

- Legend: room decorated with pages of Ostrogradski's book on mathematics

- 1869: Heidelberg

- 1871: Berlin

  (studying with Karl Weierstrass)

- 1874 doctorate *summa cum laude*

Sophia Kovalevskaya (1850-1891)

- Could not find a job – the best she found was teaching mathematics at elementary school

- 1884: travelled to Stockhool to study with Mittag-Leffler

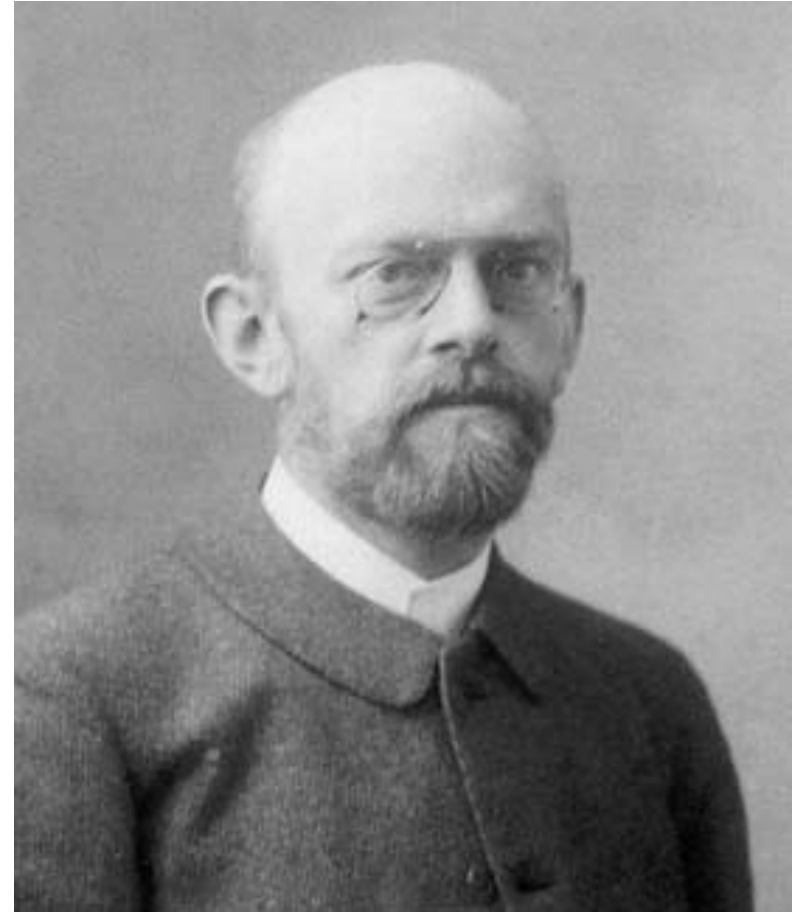- Since 1889 corresponding member of Russian academy of science

Karl Weierstrass (1815-1897)

- Thesis supervisor

- Famous among mathematicians: correspondence Weierstrass- Kovalevskaya

- „father of modern math. analysis"

- Students include:

  - Edmund Husserl

  - Mittag-Leffler

  - Hermann Schwarz

  - Carl Johannes Thomas

David Hilbert (1862-1943)

- Influential mathematician

- Advocation of women as members of the scientific community: how can gender matter in science? Why should it?

- In 1915, invited Emmy Noether to Göttingen (together with Felix Klein)

- Enabled EN lecture – under his name

- 1919 – habilitation officially granted

Emmy Noether (1882-1935)

- Higher educational school for females in Erlangen, 1889-1897;Planned to become English and French teacher there (1897)

- Father: Max Noether (Erlangen)

- Since 1900 – one of two female students (out of 1000) at U of Erlangen; possible since 1893; A-levels (Real G.): 1903

- Studying mathematics: Erlangen 1900-02, Göttingen 1903-04

- Emigration 1933

England / UK

Mary Fairfax Sommerville (1780-1872)

- Translations

- Access to libraries – through her considerate husband

- Travelled with her husband, many friends

- Translations:

- Laplace, *Mécanique céleste*

- *The Connection of the Physical Sciences (1834)*

William Herschel (1738-1822)

- British astronomer of German origin – born in Hannover

- Hannover-Bath connection

Caroline Herschel (1750-1848)

- Astronomer, helped her brother

- Music performance with her brother

- Very small

- Observations of stars
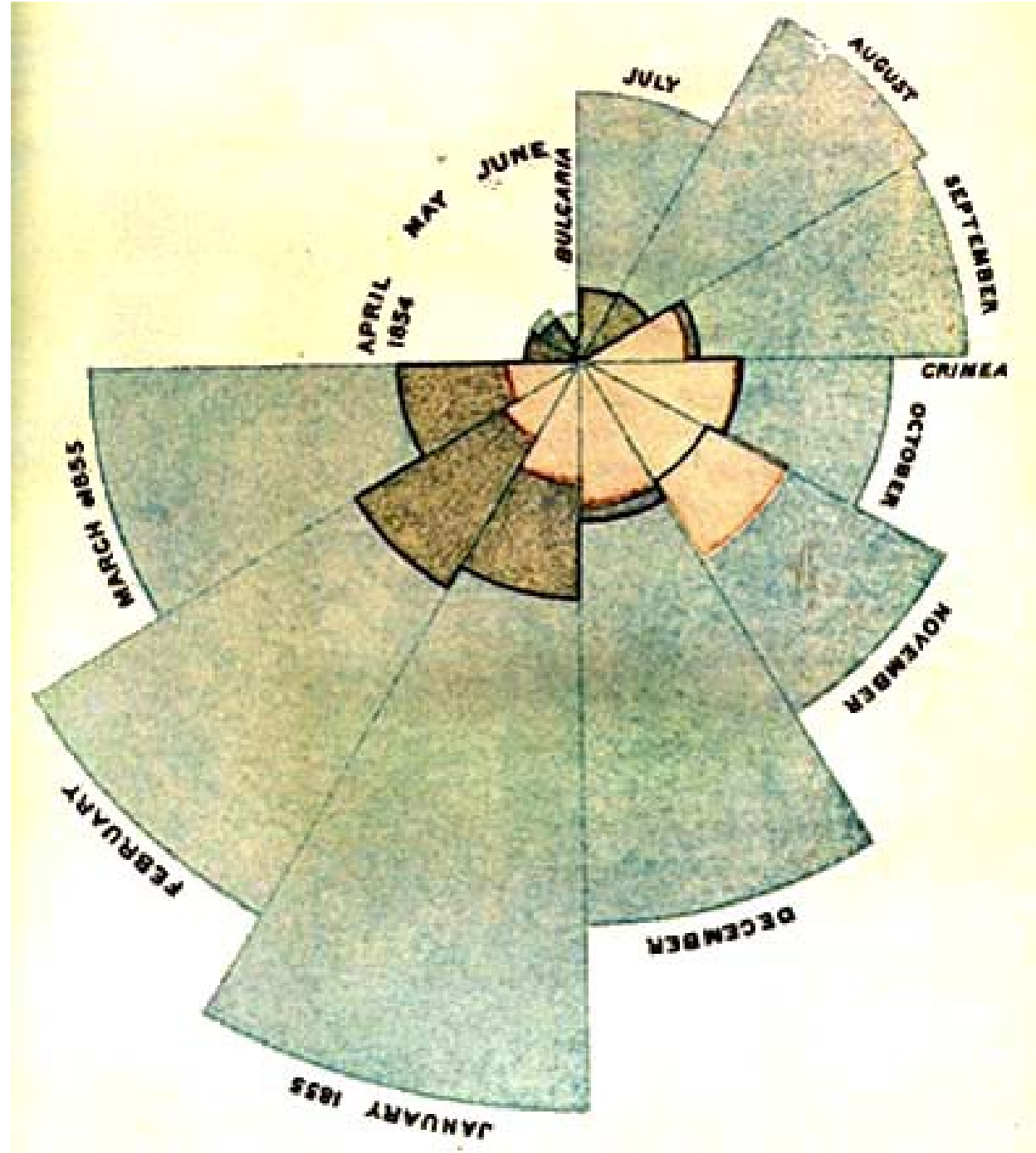
- Returned to Germany after her brother's death

Florence Nightingale (1820-1910)

- Nurse, primarily

- Taught by her father

- Mathematics: J. J. Sylvester

- Influence: the work of Quételet

- Crimean War – 1854 – worked there as a nurse, reports on patients – observations

- 1858: member of the Royal Statistical Society

Pie chart

Women in science

- Astronomers and mathematicians (see above)

- Physicists and chemists: Marie Curie, Mileva Maric, Lise Meitner, …

- School education for women: late 19th century only – secondary schools, leading to academic education

- Women could not enter universities; those who wanted to study chose medicine; then languages and humanities; later biology; while mathematics and physics came last (let alone engineering, …)

- STEM and women – false assumptions about them not being gifted