Faculté
des Sciences
Aix*Marseille Université

women in SCIENCE

BY THE END OF THIS SEMESTER, YOU WILL…

- Be able to identify more women scientists than you can now!
- Know a bit more about the history of women in science.
- Understand some of the reasons why there are so few women in science today.
- Be able to spot sexism in science more easily and be able to name it.
- Have improved your pronunciation (esp. word stress)

HOW AM I EVALUATED?

- **ORAL EXPRESSION** (a group presentation, max 4 students per group, 5 minutes per student)
- **WRITTEN EXPRESSION** (a poster - a written summary of your presentation to be handed in on the last lesson. Slides for presentation, do not present your poster)
- **LISTENING COMPREHENSION**: in the last lesson, 10 MCQs
- **READING COMPREHENSION**: x1 or x2 depending on your degree:
    - RC 1: Ben Barres, *Does Gender Matter?* (20 MCQ)
    - RC 2: unseen text (20 MCQ)

* NB: the specific percentages for each element will depend on your degree

YOUR PRESENTATION

4 students max in each group (5 mins each) + slideshow (*not* a presentation of a poster), starting in week 3 or 5 (depending on your group)

TOPIC: anything to do with women in science, for example:

- Any female scientist (living or dead) and why she deserves recognition
- Explain why there are so few women in science, why there is a gender imbalance in your domain, (differences in intelligence, motivation, different obstacles, sexism, imposter syndrome…), offer solutions, use examples of real women scientists, statistics, different theories…)
- Any scientific theories about women (film Hysteria about female orgasms, hysteria as a woman's disease, phrenology, biological sex (Anne Fausto Sterling))
- Plan an event for high school students in order to encourage girls to do science. How could AMU encourage more female students?

YOUR POSTER

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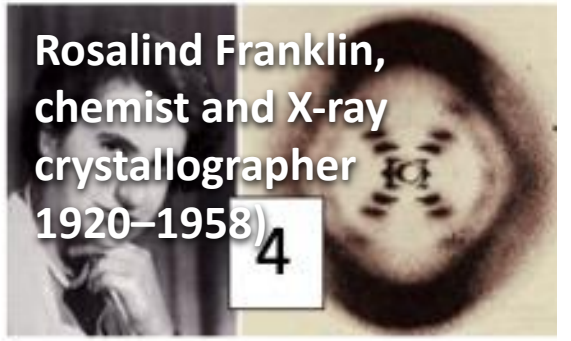
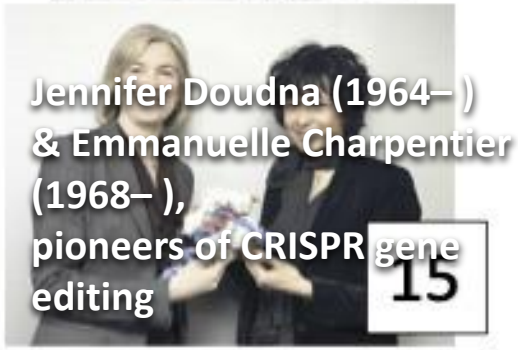
- This is a summary of your oral presentation (so it should be on the same topic as your oral presentation)
- Hand in on the last lesson (+ upload in PDF format on AMeTICE)
- 300-500 words (in YOUR OWN ENGLISH! We use a software programme to check for plagiarism)
- University logo
- Your names (first name *then* surname, i.e., Julie MACHIN not MACHIN, Julie)
- Your degree course (e.g., 3rd year Biochemistry) and the academic year (2021-22)
- You can use a free online template (see link on AMeTICE)



Emilie du Châtelet, philosopher and mathematician (1706–1749)

Marie Curie (1867–1934), chemist and physicist




Mary Anning, paleontologist
(1799–1847)


Mary Eliza Mahoney, nurse
(1845–1926)

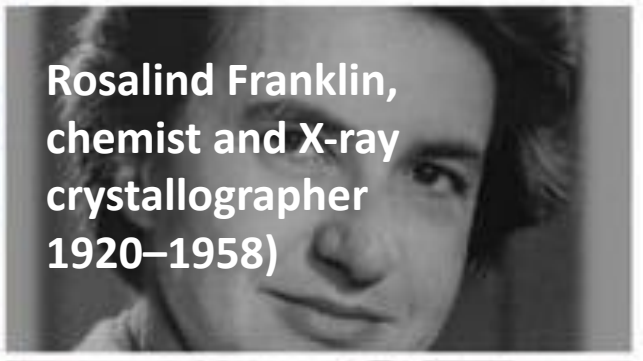

Maria Sibylla Merian,
entomologist and artist
(1647–1717)


Katherine Johnson,
mathematician
(1918-2020)


Alice Ball,
chemist
(1892–1916


Lise Meitner, physicist
(1878–1968)


Raye Montague, naval
engineer
(1935–2018)


Rosalind Franklin,
chemist and X-ray
crystallographer
1920–1958)


Mae Jemison, astronaut
(1956–)


Rachel Carson,
marine biologist
(1907–1964)


Caroline Herschel,
astronomer (1750–1848)


Bessie Coleman, aviator
(1892–1926)


Elizabeth Blackwell, doctor
(1821–1910)


Ada Lovelace, mathematician
(1815–1852)


Patricia Bath,
ophthalmologist and inventor
(1942–


Zaha Hadid,
architect
(1950–2016)


WOMEN IN SCIENCE

- **Marie Curie**: 1st and only person in history (at that point) to win 2 Nobel Prizes in 2 different fields, pioneered radiation research and discovered 2 new elements. Denied membership of the French Academy of Sciences (because she was a woman).

- **Caroline Herschel**: German astronomer, discovered several comets, 1st woman we know of who was paid for her contribution to science, 1st woman to be awarded a Gold Medal of the Astronomical Society, 1st woman to be named an honorary member of the Royal Astronomical Society.

- **Lise Meitner**: Nuclear physics and radioactivity, she discovered nuclear fission but only her collaborator (a man) was awarded the Nobel Prize.

- **Hypatia of Alexandria**: Greek mathematician, philosopher and astronomer, head of a school in Alexandria, murdered by a Christian mob

- **Jocelyne Bell Burnell**: Discovered the 1st radio pulsar “the greatest astronomical discovery of the 20th century!”. Her PhD supervisor was later awarded a Nobel Prize for her discovery!
  (BTW she’s done a TED talk about sexism in science which is very good!)

- **Cecila Payne-Gaposchkin**: Discovered what the sun is made from. The leading astronomer of the day dismiss her hypothesis and told her NOT to present her findings. 4 years later HE published her findings under HIS name!

- **Rosalind Franklin**: Performed work that was vital to the structure of DNA. Her colleague shared her work with Watson and Crick without her permission. This info helped them discover structure of DNA - they won the Nobel Prize, Franklin got nothing.

- **Amalie Emmy Noether**: contributions to rings, fields and algebras. Her theorem = “one of the most imp mathematical theorems ever proved in guiding the development of modern physics”. Worked without pay for 7 years and lecture under a male colleague’s name because her university objected to women lecturers.

WOMEN SCIENTISTS IN THE ANCIENT WORLD

Aglaonice

2nd / 1st century BCE

Astronomer who could predict the time and general area where a lunar eclipse would occur.

Metrodora

1st Century CE

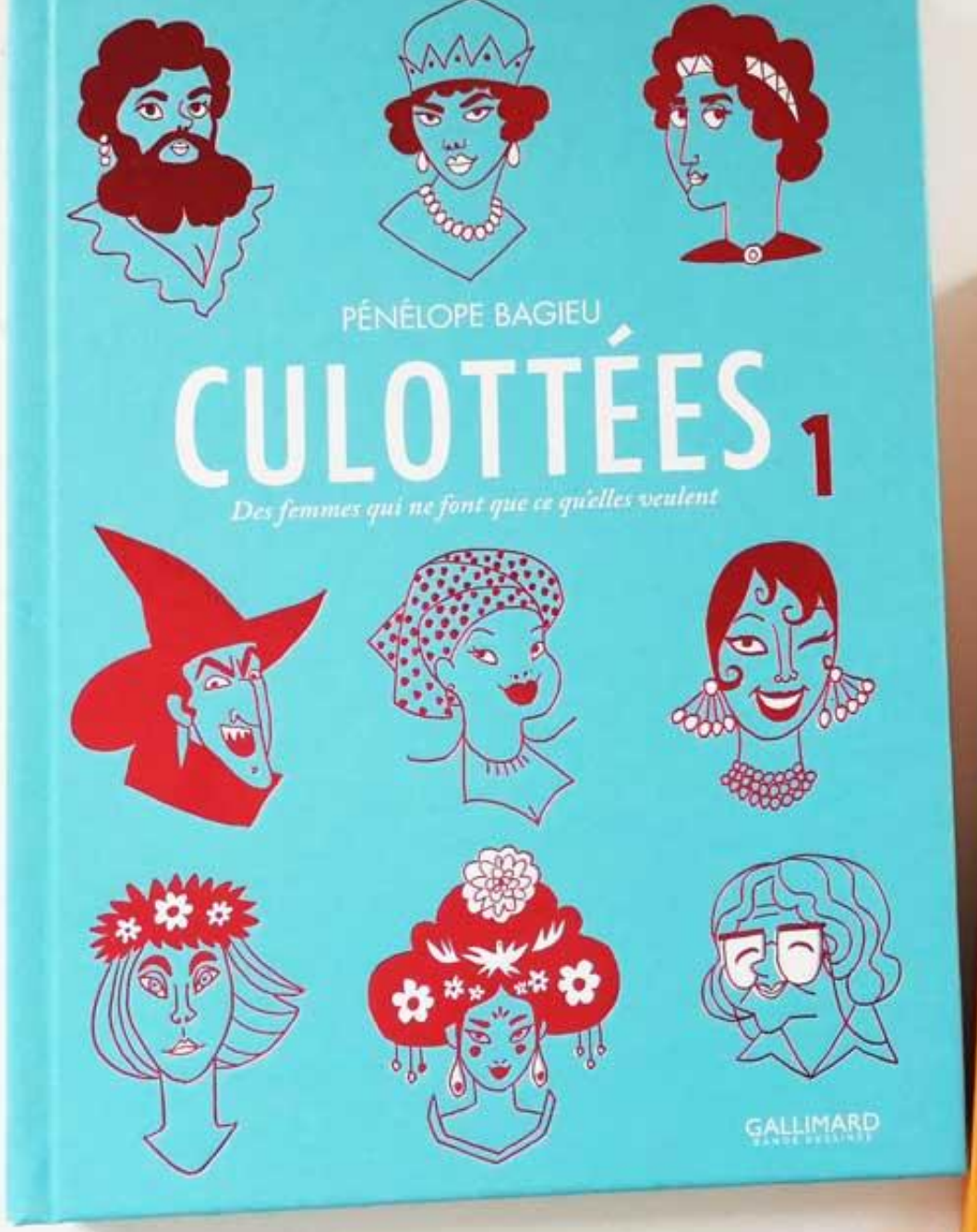
Physician and author of the oldest medical text known to have been written by a woman, *On the Diseases and Cures of Women.*

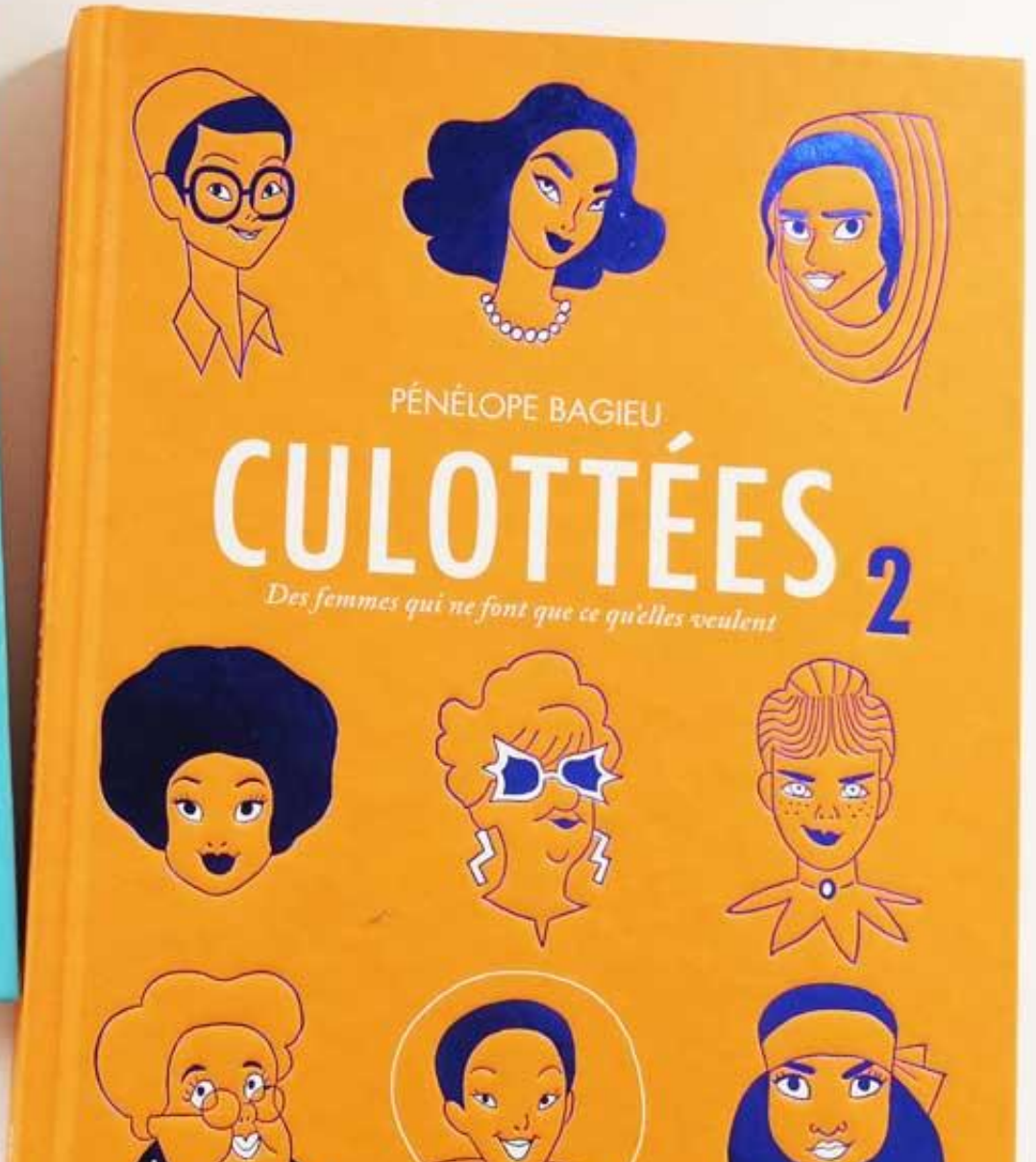
Hypatia of Alexandria

4th Century CE

Philosopher, astronomer and mathematician. Murdered by a mob of Christians.

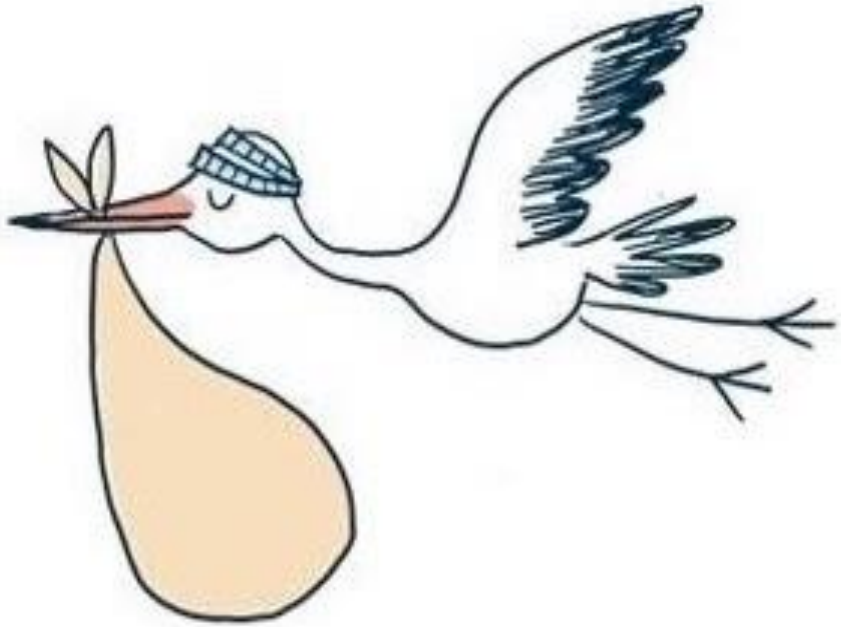
AGNODICE /ˈægnədɪs/

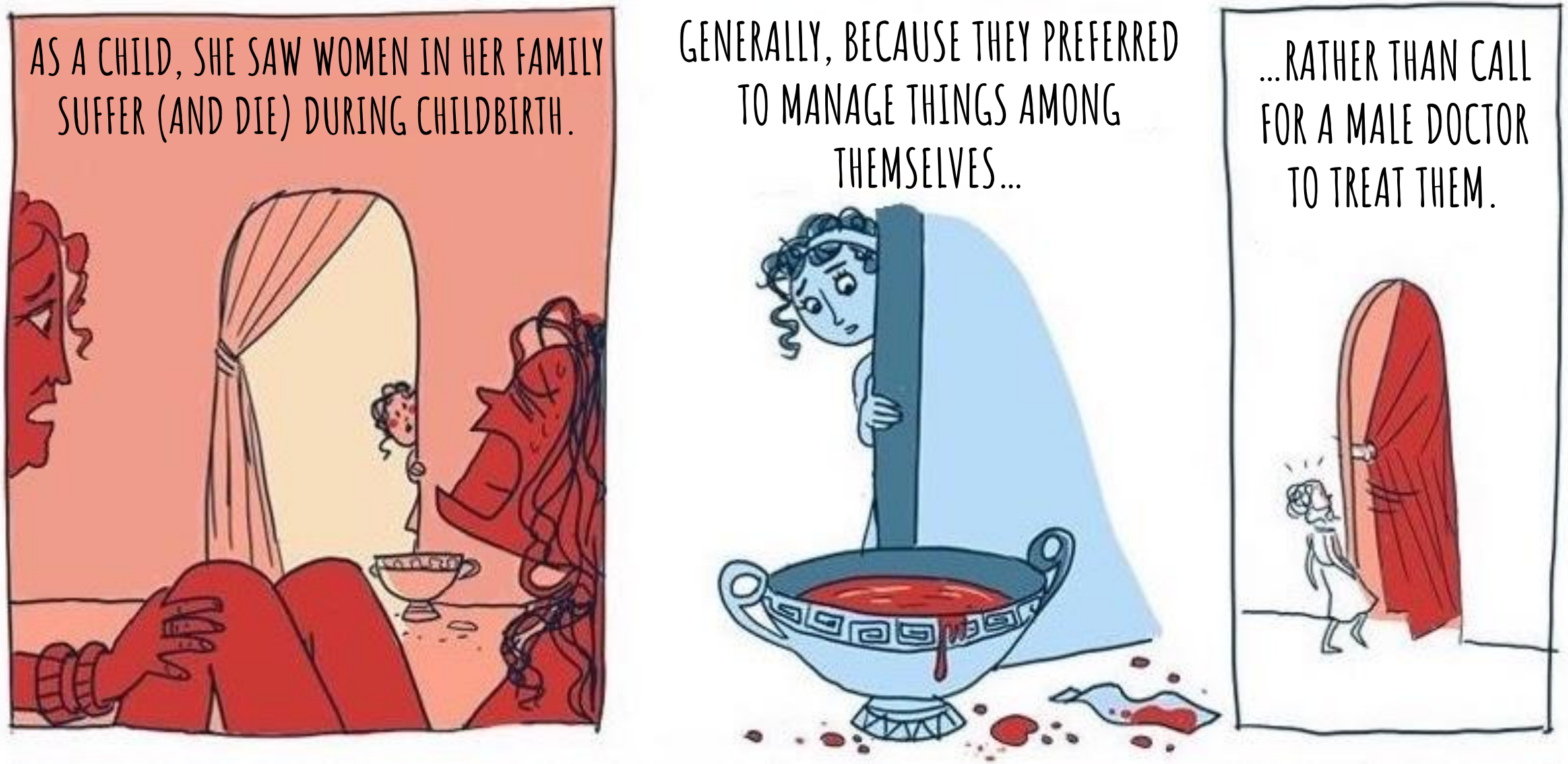

PÉNÉLOPE BAGIEU
CULOTTÉES 1
Des femmes qui ne font que ce qu'elles veulent
GALLIMARD


PÉNÉLOPE BAGIEU
CULOTTÉES 2
Des femmes qui ne font que ce qu'elles veulent

CULOTTÉES: AGNODICE

AGNODICE WAS BORN IN THE 4TH CENTURY BCE IN ATHENS




AS A CHILD, SHE SAW WOMEN IN HER FAMILY SUFFER (AND DIE) DURING CHILDBIRTH.
GENERALLY, BECAUSE THEY PREFERRED TO MANAGE THINGS AMONG THEMSELVES...
...RATHER THAN CALL FOR A MALE DOCTOR TO TREAT THEM.

IN FACT, THE ATHENIANS HAD RECENTLY FORBIDDEN WOMEN FROM PRACTICING MEDICINE, SUSPECTING THEM OF PERFORMING ABORTIONS.

(THUS DESTROYING THE BOND OF TRUST THAT HAD EXISTED UP TO THAT POINT BETWEEN FEMALE DOCTORS AND THEIR PATIENTS.)

YOUNG AGNODICE WAS OUTRAGED BY THIS ABSURD SITUATION.

PRETENDING TO VISIT A SICK FRIEND, SHE SET OFF ON A LONG TRIP

IN REALITY, SHE WENT TO EGYPT...

WHERE GIRLS WERE ALLOWED TO STUDY MEDICINE.

HER SOLID (AND SECRET) TRAINING IN THE BAG, SHE CAME BACK TO GREECE, DETERMINED TO HELP THE WOMEN OF ATHENS.

Hmm... Yes, that's all well and good, but I still don't have the right to work.

SO, SHE RESOLVED TO DISGUISE HERSELF AS A MAN TO BE ABLE TO WORK

AT FIRST, SHE ENCOUNTERED THE SAME RELUCTANCE AS HER MALE COLLEAGUES

BUT ONE DAY, SHE SAVED THE LIFE OF ONE OF HER PATIENTS...

WHO TOLD HER FRIENDS ABOUT A VERY UNCOMMON DOCTOR

NEWS TRAVELLED ALONG THE GRAPEVINE, AND AGNODICE QUICKLY BECAME "THE" GYNAECOLOGIST IN ATHENS.

THIS MYSTERIOUS MONOPOLY WAS STARTING TO GET ON THE OTHER DOCTORS' NERVES...

AND THEY ENDED UP ACCUSING AGNODICE OF TAKING ADVANTAGE OF HER MARRIED PATIENTS.

SHE WAS JUDGED BEFORE A COURT OF HUSBANDS AND DOCTORS.

Very well

You asked for it

WITH NO OTHER OPTION, AGNODICE WAS FORCED TO REVEAL THE INDISPUTABLE PROOF OF HER INNOCENCE.

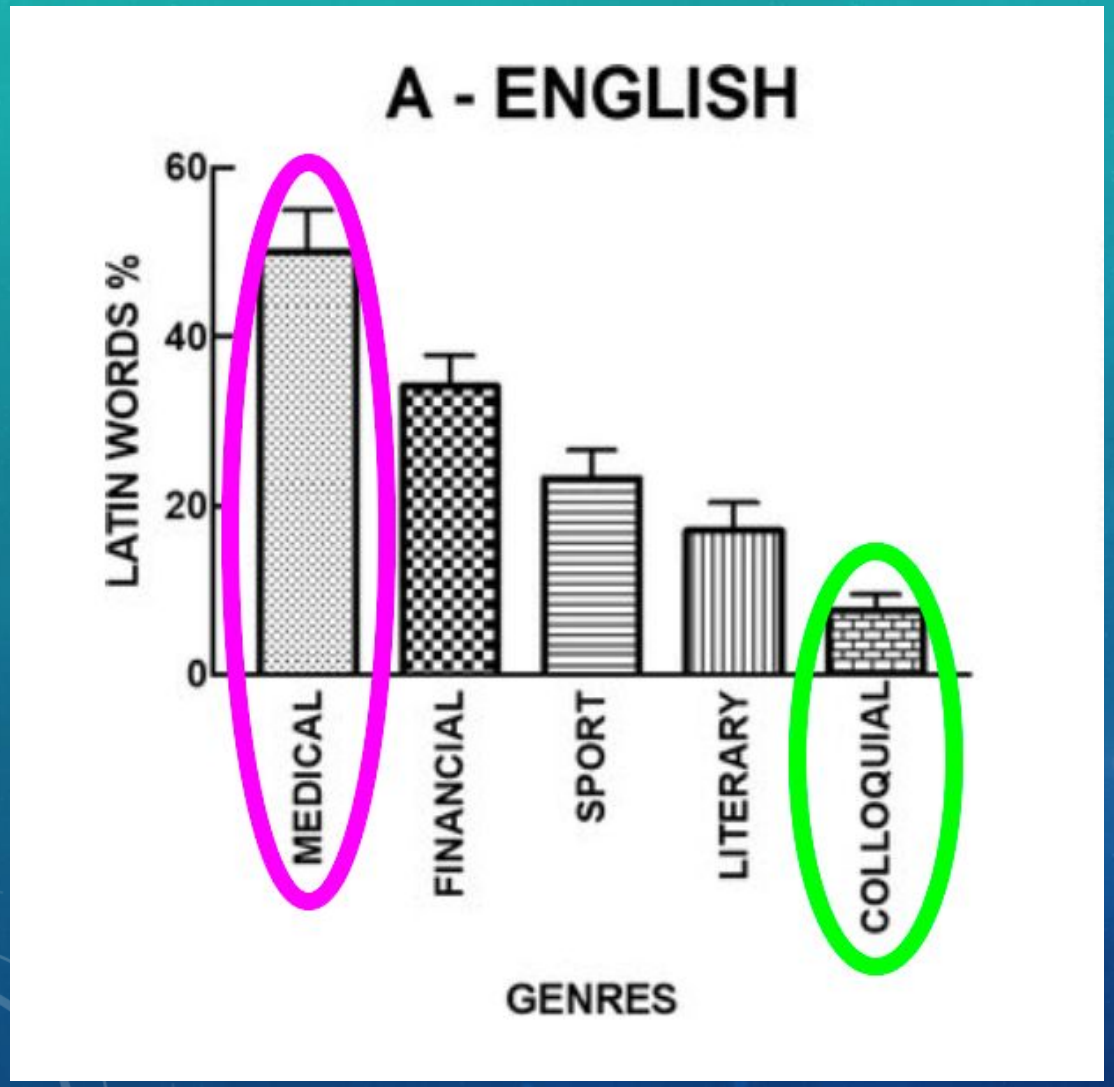
THEY WERE EVEN MORE FURIOUS (AND ESPECIALLY HUMILIATED FOR HAVING BEEN FOOLED), AND CONDEMNED HER TO DEATH FOR THE ILLEGAL PRACTICE OF MEDICINE.

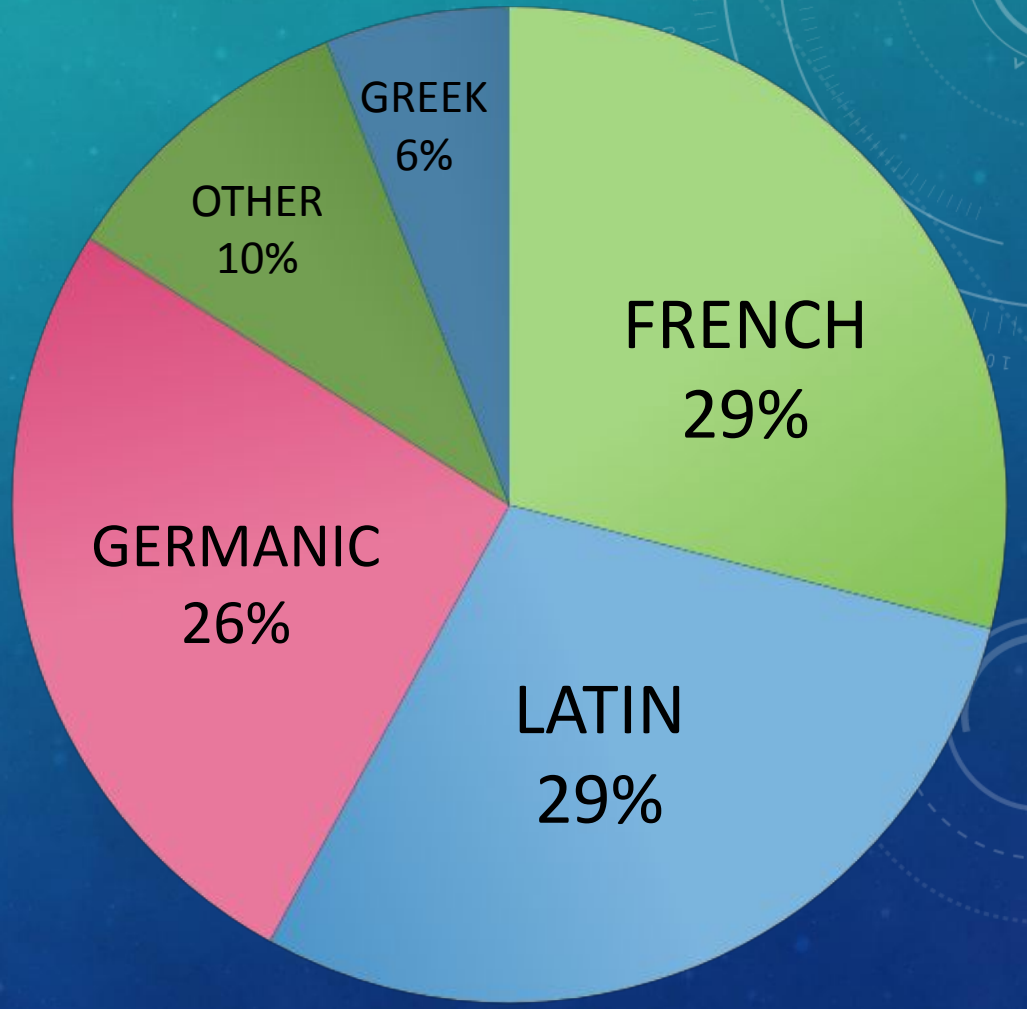
THAT WAS WHEN A CROWD OF ANGRY PATIENTS APPEARED. THEY HAULED THEIR HUSBANDS OVER THE COALS AND POINTED OUT TO THE DOCTORS THAT ALL THEY NEEDED TO DO WAS BE LESS USELESS.

ASHAMED, THEY EVENTUALLY CLEARED THE ACCUSED...

... AND AUTHORISED FEMALE DOCTORS ONCE AGAIN IN ATHENS.

THE ORIGIN OF WORDS IN ENGLISH





SOME EXAMPLES

- *ou* (not) + *topos* (place) → utopia (1516)
- *zôion* (animal) + *logos* (knowledge) → zoology (1669)
- *hydro* (water) + *dunamikos* (powerful) → hydrodynamics (1738)
- *phōtós* (light) + *graphê* (drawing / writing) → photography (1834)
- *gynē* (woman) *gynaiko* + *logos* (knowledge) → gynaecology (1847)
- *ōión* (egg) + *kutos* (vessel / jar) → oocyte (1895)
- *helix* (spiral shaped) + *baktēría* (little staff /stick) → helicobacter (1989)

EVER WONDERED WHY SOME ENGLISH PLURALS ARE “IRREGULAR”?

- -on → a
  - phenomenon → phenomena , criterion → criteria
- -sis --> -ses /sɪs/ → /si:z/
  - crisis → crises, analysis → analyses, hypothesis → hypotheses
- -um → a
  - bacterium → bacteria, datum → data
- -us → i /aɪ/
  - fungus → fungi, cactus → cacti

GREEK INFLUENCE ON ENGLISH

ελληνική γλώσσα

English

ANSWERS to video

1. What are the two estimates for the percentage of Greek words in English? Explain the difference..

   6% and 12-15%%

   6% = *token* frequency (how often the word is used)

   12%-15% = *type* frequency (does *not* take into account frequency of use)

   Lots of Greek words in English but not used that frequently (specialised vocab)

2. How did most Greek words enter English?

   Indirectly through Latin or Latin via French

3. True or false: most Greek words in English already existed in Greek.

   False – most of them were created from Greek morphemes but didn't exist before that as whole words.

4. What is interesting about the words *television, automobile* and *sociology*?

Greek + Latin morphemes = “hybrid” [they usually tried to avoid mixing morphemes]

5. What does *bio* mean in Greek?

Life, living thing

6. What does *micro* mean in Greek? nb /maɪkrəʊ/

Small

7. How are Latin and Greek words used differently in the field of medicine?

Latin for parts of the body and Greek for illnesses or specialisations, e.g., *cutis* (Latin) *dermatology* (Greek)

[sore throat = everyday language (Germanic origin) vs pharyngitis (what your doctor might say)

Greek pharynx (= throat) + -itis (= inflammation)

8. What are the 4 hints for recognising Greek vocabulary?

- Words starting with ph-
- Ae / oe
- -y- between consonants (apocalypse, encyclopedia)
- Words beginning with certain consonant clusters, e.g., ps-, pn-, chr-

9. How do English speakers pronounce these consonant clusters?

We drop the first letter.

PHONOLOGY 1:
SILENT LETTERS AT THE BEGINNING OF A WORD IN SOME GREEK CONSONANT CLUSTERS

- ps =/s/
  - psychology, psychiatrist, pseudo-scientific
- pn- = /n/
  - pneumonia…
- gn = /n/
  - gnome, gnostic, gnat, gnaw, …
- mn- = /n/
  - mnemonic

But no silent letters if in the middle:

- ps =/ps/
  - synopsis
- pn- = /pn/
  - hypnosis
- gn = /gn/
  - prognosis
- mn- = /mn/
  - amnesia

PHONOLOGY 2:
GREEK CLASSICAL COMPOUNDS & WORD STRESS

- Why *‘photograph* but *pho’tographer*?
- Why *‘microscope* but *mi’croscopy*?
- Why *‘pentagon* but *pen’tagonal*?

Element A (1, 2 or 3 syllables)	Element B (usually monosyllabic)	Element C (monosyllabic non-neutral suffix)
For example: Eu-, syn/sym, anti-, auto-, atmo-, bio-, cata-, deca-, dia-, epi-, cosmo-, hecto-, hexa-, homo-, hydro-, iso-, micro-, mono-, ortho-, oxy-, para-, patri-, photo-, tele-, anthropo-, biblio-, cephalo-, gastero-, helio-, hetero-, ideo-, idio-, lexico-, megalo-, ornitho-, palaeo-, radio-, spermato-, stereo, …	**For example:** -arch-, -crat-, -dox-, -gene-, -gloss-, -glot-, -gram-, -graph-, -gon-, -log(ue)-, -lys-, -nom-, -nym-, -path-, -phon-, -pol-, -pod-, -scop-, -soph-, -stat-, -thes-, -latr-, -metr-, -loqu-, …	**The full list:** -al, -ence, -ent, -er, -es, -is, -ism, -ist, -ise/-ize, -ous and -y

- Element A + B = stress on 1st syllable of element A (‘**pho**tograph)
- Element A + B + C = stress on last syllable of element A (pho’**to**grapher)

HOMEWORK (READING): HYPATIA OF ALEXANDRIA