

Subject: [Bsc-es] EQUITY4ES GAZETTE #5 - July 2023

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Issue #5

Eunice Newton Foote & The Matilda effect

Welcome to the fifth issue of the Equity4ES gazette!

In these issues, we cover the latest debates on gender equity. We bring to the table arguments in favour and against topics, policies and initiatives that are being proposed around the world to address gender gaps in the workplace, science and the public sphere.

This fifth issue deals with the problem of **women not being credited for their work in science**, with a focus on **Eunice Newton Foote**, a pioneer of the discovery of the greenhouse effect.





Eunice Newton Foote (United States, 1819-1888) was an American scientist and women rights advocate. She was the first scientist to [discover](#), as early as 1856, that some atmospheric gases warm up when exposed to sunlight, and that increasing levels of carbon dioxide (CO₂) would rise the temperature of the planet, eventually leading to changes in the climate (which we know today as “greenhouse effect”) [1]. This discovery was pivotal since it provided a direct link between human emissions of GHGs and the steady rise in global mean surface temperature,

paving the way for future studies on the physical science basis of climate change.

For more than a century, her contributions to climate science were unknown and attributed to **John Tyndall** (Ireland, 1820-1893), an Irish physicist who has been widely credited for discovering the ability of certain atmospheric gases, including carbon dioxide (CO₂), to absorb heat (i.e. infrared radiation) [1]. In the last decades, her work regained attention when it became clear that her discoveries on the link between greenhouse gases and temperature preceded those of Tyndall by more than 3 years [2].

Life & Work

Foote participated in the **Seneca Falls Convention of 1848**, the first organisation in the United States focusing solely on women’s rights. Her 1856 publication was the first work in the field of Physics to be published in a scientific journal (American Journal of Science and Arts) by an American woman [1], with no other work being published by a woman until 1889.

Interest in her contributions to science was not recovered until the 1970s, when historians noticed her participation in the 1856 and 1857 conferences

of the **American Association for the Advancement of Science**, where she orally presented her work.

In 2011, she gained even more attention when geologist Ray Sorenson published a short paper on her discoveries [2], which was followed by an article published in 2016 by Leila McNeill [5], editor of the Smithsonian magazine Lady Science. Last year, the AGU instituted the **Eunice Newton Foote Medal for Earth-Life Science** in her honor to recognize outstanding scientific research.

Why was she originally not credited for her discovery?

In recent decades, many women scientists such as **Lise Meitner**, **Rosalind Franklin**, **Emmy Noether** or **Chien-Shiung Wu**, who had been systematically not credited during their lifetime, have been rightfully recognized for their outstanding scientific contributions. Sadly, not crediting women for their discoveries is a recurrent theme in the history of science that transcends disciplines.

Eunice Foote is also one of those women who had to endure the same injustice. Science historians believe that this occurred for three reasons: because she was a woman,

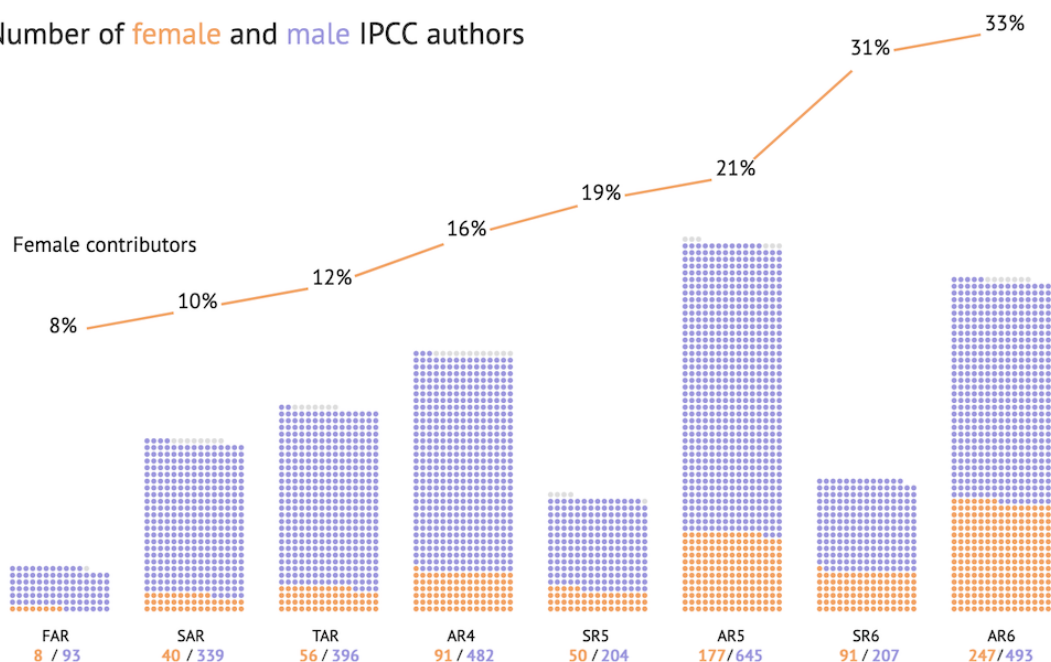
because she was an amateur scientist (for not citing previous works), and because American scientists at the time were not as established as their European colleagues.

This bias against acknowledging the work of women scientists is in fact so common that it has its own name, the **Matilda effect**. The term was coined by science historian **Margaret W. Rossiter**, though it was first described by suffragist and abolitionist **Matilda Joslyn Gage** (United States, 1826-1898). We encourage you to check the **Recommended reads** section to learn more about it.

Current leading women climate scientists

IPCC reports now have record numbers of female authors, but men still dominate

Number of female and male IPCC authors



Source: Carbon Brief, Sarah Connors, Diana Liverman, Miriam Gay, The IPCC Secretariat



There is still a long way to go, as **women in science are still less credited than men** [3]. The Intergovernmental Panel on Climate Change (IPCC) encompasses the world's

Only 31% of the IPCC authors live in the global South (despite accounting for 4/5 of the Earth's population), hence not only the female representation in the IPCC leaves a

top experts on climate science, who compile the latest publications on the physics of climate change, as well as mitigation and adaptation aspects. When the first assessment report (FAR) of the IPCC was launched in 1990, women only accounted for 8% of all contributors [4]. This number has increased in the last 30 years, with 33% of the authors of the sixth assessment report (AR6), in the period 2021-2023, being women.

lot to be desired, but also raises awareness on the **gender imbalance between rich and developing countries** [4].

On a positive note, we wanted to highlight the role and inspiration from some climate scientists that contribute with their work and leadership to make climate science more inclusive and impactful. These women are [Freda Otto](#), [Lisa Goddard](#), [Sonia Seneviratne](#), [Kim Cobb](#) and [Petra Tschakert](#).



Recommended reads

- **Climate Justice: A Man-Made Problem With a Feminist Solution.** Mary Robinson, Bloomsbury Editorial.
- [Women Scientists Were Written Out of History. It's Margaret Rossiter's Lifelong Mission to Fix That.](#) Susan Dominus, Smithsonian Magazine.

References

- [1]: Foote, E. (1856). Circumstances Affecting the Heat of the Sun's Rays. The American Journal of Science and Arts, 22, no. 66, 383–384. <https://archive.org/details/mobot31753002152491/page/381/mode/2up?view=theater>
- [2]: Sorenson, R. P. (2018). Eunice Foote's pioneering research on CO2 and climate warming. Search and Discovery. https://www.searchanddiscovery.com/documents/2018/70317sorenson/ndx_sorenson.pdf
- [3]: Ross, M. B., Glennon, B. M., Murciano-Goroff, R., Berkes, E. G., Weinberg, B. A., & Lane, J. I. (2022). Women are credited less in science than men. Nature, 608(7921), 135-145. <https://www.nature.com/articles/s41586-022-04966-w>
- [4]: How the diversity of IPCC authors has changed over three decades, Ayesha Tandon, CarbonBrief. <https://www.carbonbrief.org/analysis-how-the-diversity-of-ipcc-authors-has-changed-over-three-decades/>
- [5]: This Suffrage-Supporting Scientist Defined the Greenhouse Effect But Didn't Get the Credit, Because Sexism, Leila McNeill, Smithsonian Magazine :<https://www.smithsonianmag.com/science-nature/lady-scientist-helped-revolutionize-climate-science-didnt-get-credit-180961291/>

Public Mailbox

As part of the Equity4ES initiatives, we have opened a **public mailbox** to collect **anonymous testimonials** and experiences regarding gender issues in the workplace. We would like to share these testimonies publicly to raise awareness of these issues amongst

our colleagues. Other aspects such as suggestions, ideas and feedback are also welcomed.

Public Mailbox

Agenda

- **Monthly meetings** the **3rd Friday** of every month at **4 PM**. We usually meet in room 0-1-13 and also online.

Zoom link: <https://rediris.zoom.us/j/6793792181>

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