
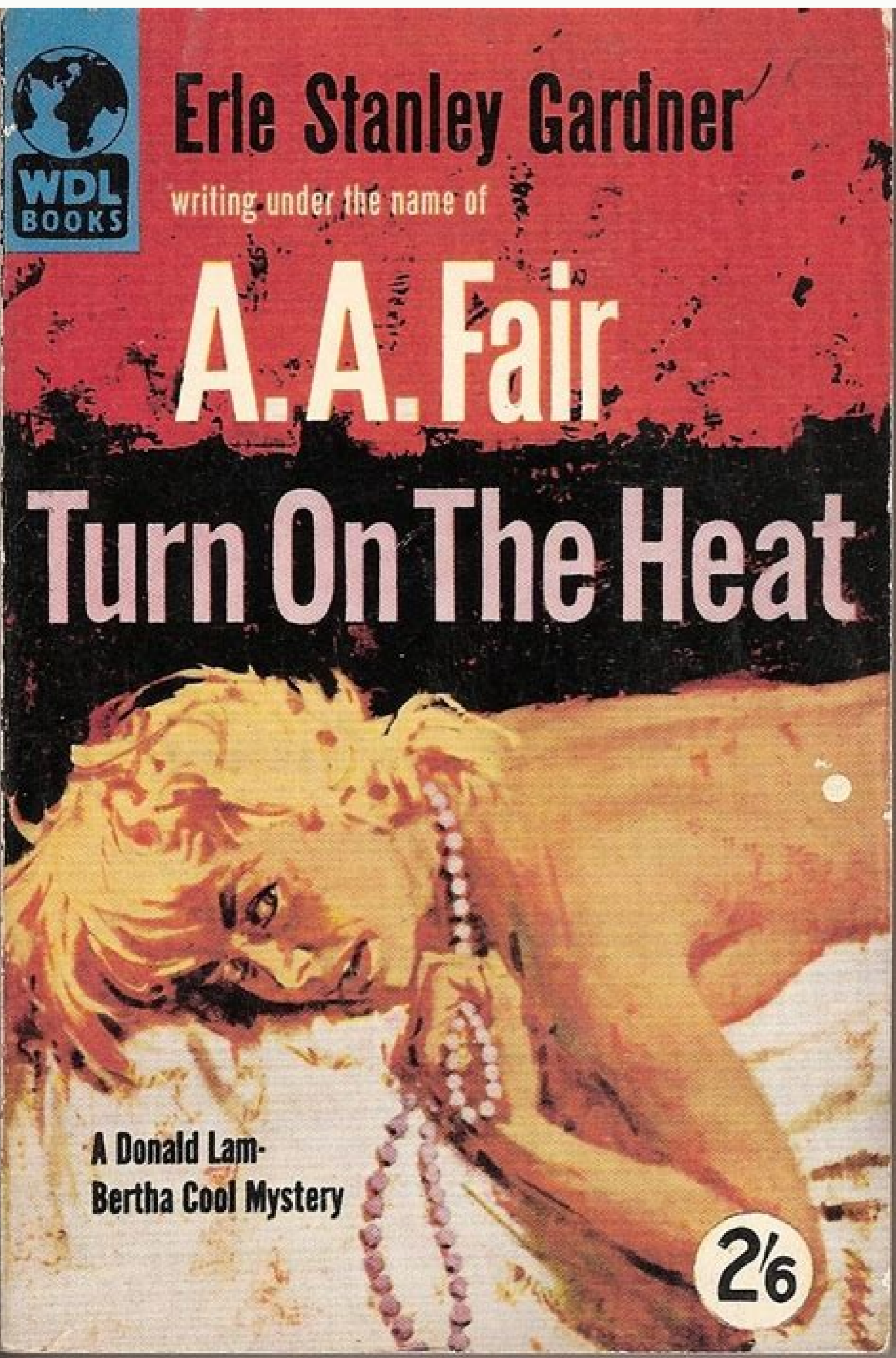


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Turn Down the Heat - Annotated Notes - Robert D. Corrie February 18, 2014

This final project for Coursera's 'Turn down the heat' summarizes the key learning outcomes for the class:

- 1. We are already experiencing significant impacts from -0.6 to 0.8 deg Celsius warming, with at least another 0.6 to 0.8 deg in the pipeline
- 2. We are headed straight at 450 ppm CO₂ (by 2035), potentially a 'tipping point' for climate change and widespread ecosystem damage
- 3. Warming of 2 degrees C may not be adiabatic (Hansen 2013) and further warming from amplifying feedbacks could take us to 3 deg C and even warmer

Three looming factors include deglaciation of ice sheets, ocean acidification, and methane hydrate release. In addition to heat storms, Ocean acidification itself becomes an ever growing threat, within 20 years the ocean pH of 8 will lead to loss of 90% of all coral, and potentially the productivity of plankton, the base of the food chain.

The course provided a wonderful foundation for understanding the integrated impacts of climate change, and why we MUST do everything possible to stay under 450 ppm CO₂ and 2 deg of warming.

James Hansen Columbia University and formerly NASA GISS, published in PLoS: Assessing dangerous climate change (Nov 2013) making the following similar points:

- 1. We are experiencing significant climate impacts from droughts, heat storms, floods, fires, pest migration at barely 1 deg Celsius warming
- 2. While scientists in the past have argued that 2 deg C is the edge of what might be considered safe (or barely survivable), recent data argues against that. 2 deg might not only be too much, we may not be able to stop warming there, and as amplifying feedbacks (albedo and methane hydrates) could take us to 3 deg C even without more fossil fuel combustion
- 3. The risk of warming may have already triggered irreversible deglaciation of Greenland ice sheets, the Arctic Ocean may be 'open sea' by 2015, triggering instability in methane hydrates on the sea floor

The upshot of the Hansen article is that staying under 2 deg C would be better than reaching that level, and in order to do so, we should by to limit fossil fuel combustion to no more than 1,000 Gt. From my calculations, and observing that we are at 400 ppm CO₂ at 375Gt carbon combustion, and adding 2+ ppm CO₂ annually (at ~100T carbon combustion), we don't have that much room, and need to stop at 650 to 700Gt, and we will crash through 450 ppm by 2035 at today's rate of growth. After reading Hansen's article, I no longer believe that we can avoid disastrous climate impacts (storms, droughts, floods) and could be headed to catastrophic impacts (based in research published by the International Arctic Research Center, that has observed a doubling in arctic methane release from ocean floor methane hydrates (17 Gt and 6 ppm atmospheric CH₄). In my estimation, opening of sea ice in the arctic will destabilize sea floor permafrost, leading to increasing rates of methane release, leading to releases of 500 Tg annually by 2035. An eventual release of 500T methane (over decades) with a GWP (Global Warming Potential) would be equivalent to 1000Gt carbon, the ENTIRE carbon budget that Hansen states we MUST NOT burn through.

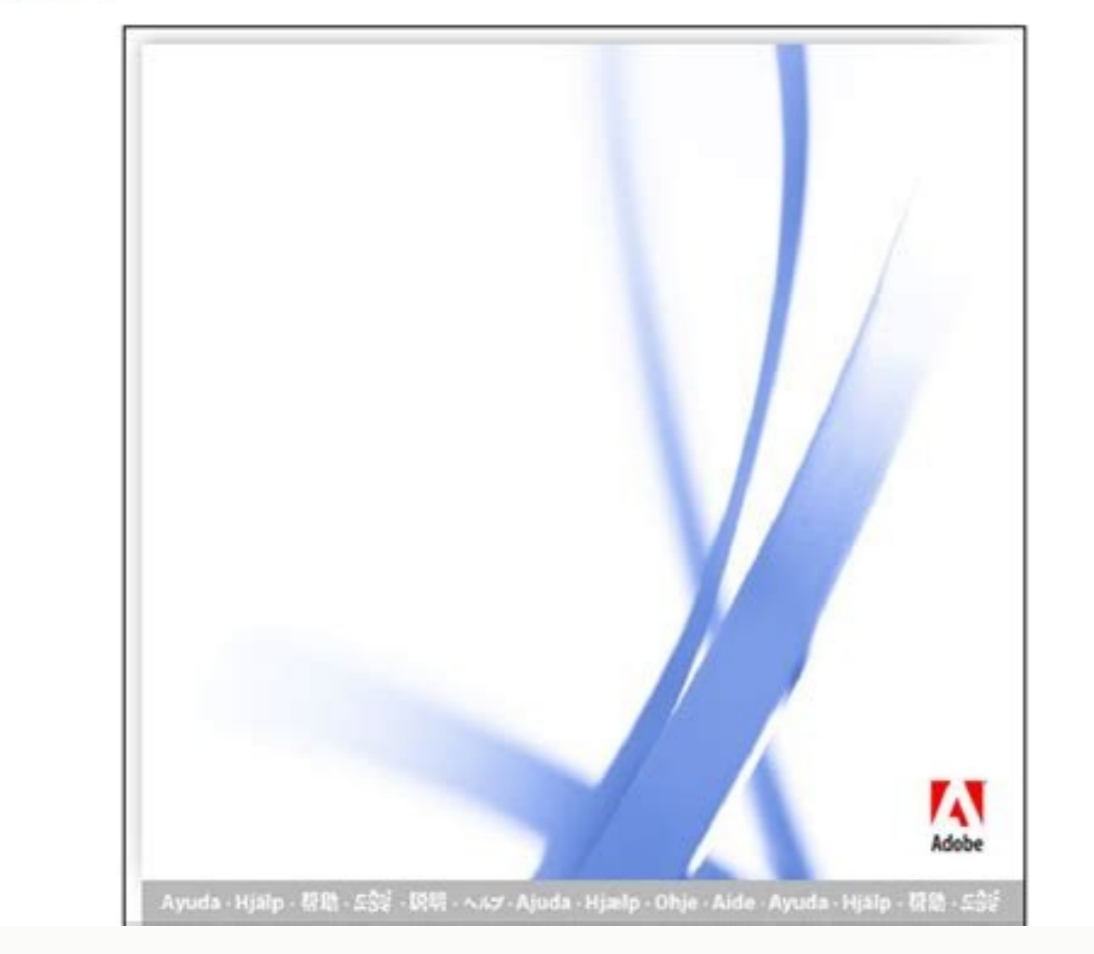
Slide 3 - temperature anomaly chart

A key figure in Hansen's article is a chart showing temperature anomaly and cumulative anthropogenic carbon emissions (GtC). The chart shows we have marched halfway up a path to 2 degrees Celsius. Having burned - 375 GtC, another 375 GtC might be burned in as little as 25 years.

Slide 4 - Era of consequences

At just 0.8 deg C warming, we are already experiencing recent heat storms, droughts, fires, superstorms, pest migration, crop and soil stress, heat related disease and death, and property and insurance loss.





RULES AND REGULATIONS.
80

steamer to give his entire time to the interest of the fire department, and he shall at all times be in attendance at his engine house.

He shall be held personally responsible for the care of the engine and boiler. He shall accompany the engine to all fires and alarms of fire, and shall have full charge of the running of the engine, subject to the orders of the captain and all superior officers.

He shall see that at all times his engine is ready for use. Should an alarm of fire occur during the absence of either of the drivers, he must drive in his stead. He must also assist in the care of the house.

He shall do all repairs, if possible, when so ordered by his superior officers.

STOKERS.—The stoker may be assigned to that position from among the call men by the captain, and shall, under the direction of the engineer, assist in the care and management of the engine at fires.

They shall see that the engine is properly supplied with fuel, and perform such other duties as may be required of them by the engineer.

DRIVERS.—It shall be the duty of the drivers of each engine, hose wagon and hook and ladder truck to be in constant attendance at their respective houses. They shall have charge of the horses, harness and stables, &c., and have them well cleaned each morning.

They shall take charge of the horses of the company during the service of their apparatus at fires.

In cold and stormy weather, on arriving at a fire, they

Reagle, Joseph (2007). "Wikipedia is twenty, 89–153. Archived from the original on September 9, 2016. Retrieved February 3, 2022. Archived from the original on January 10, 2022. "Wikipedian Justice". ^ "Wikimedia Traffic Analysis Report - Wikipedia Page Views Per Country". Editors who fail to comply with Wikipedia cultural rituals, such as signing talk page comments, may implicitly signal that they are Wikipedia outsiders, increasing the odds that Wikipedia insiders may target or discount their contributions. ^ "Wikipedia experience sparks national debate". Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI). ^ Thiel, Thomas (September 27, 2010). NBC News. ISBN 978-0262014472. ^ "Server roles at wikitech.wikimedia.org". Reuters. Stuart Geiger; Morgan, Jonathan T.; Riedl, John (2012). ^ "Wikimedia". "Licensing update/Questions and Answers". ^ a b Rawlinson, Kevin (August 8, 2011). (Includes video.) 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Proceedings of the ACM on Human-Computer Interaction. Retrieved February 13, 2008. About 47 percent of Wikipedia readers do not realize that Wikipedia is a non-profit organization.[322] COVID-19 pandemic Main article: Wikipedia coverage of the COVID-19 pandemic During the COVID-19 pandemic, Wikipedia's coverage of the pandemic received international media attention, and brought an increase in Wikipedia readership overall.[323] Cultural significance of Wikipedia in webcomics redirects here. doi:10.4018/jtc.2016040101. Notably, the results of a Wikimedia Foundation survey in 2008 showed that only 13 percent of Wikipedia editors were female.[135] Because of this, universities throughout the United States tried to encourage women to become Wikipedia contributors. SSRN 1496716. ^ Grossman, Lev (December 13, 2006). Retrieved February 9, 2013. Vol. 4956. "The Unbearable Bureaucracy of Wikipedia". Perth; New York City: Association for Computing Machinery. Retrieved April 24, 2016. Bertelsmann did not resort to euphemism this week when it announced the end of the Brockhaus encyclopedia brand. Archived from the original on June 2, 2005. London. Business. For Derakhshan, Wikipedia's goal to argue as an encyclopedia represents the Age of Enlightenment tradition of rationality triumphing over emotions, a trend which he considers "endangered" due to the "gradual shift from a typographic culture to a photographic one, which in turn mean[s] a shift from rationality to emotions, exposition to entertainment". Archived from the original on February 20, 2007. meta.wikimedia.org. O'Reilly Media. Although Wikipedia content has been accessible through the mobile web since July 2013, The New York Times on February 9, 2014, quoted Erik Möller, deputy director of the Wikimedia Foundation, stating that the transition of internet traffic from desktops to mobile devices was significant and a cause for concern and worry.[10] The article in The New York Times reported the comparison statistics for mobile edits stating that, "Only 20 percent of the readership of the English-language Wikipedia comes via mobile devices, a figure substantially lower than the percentage of mobile traffic for other media sites, many of which approach 50 percent. a dedicated group of a few hundred volunteers" makes the bulk of contributions to Wikipedia and that the project is therefore "much like any traditional organization".[125] In 2008, a Slate magazine article reported that: "According to researchers in Palo Alto, one percent of Wikipedia users are responsible for about half of the site's edits".[126] This method of evaluating contributions was later disputed by Aaron Swartz, who noted that several articles he sampled had large portions of their content (measured by number of characters) contributed by users with low edit counts.[127] The English Wikpedia has 6,494,676 registered editors, and 125,393 active editors. Namely, as a community, Wikipedia lacks the habit or tradition of respect for expertise. Forbes. Main article: Wikipedia in culture Wikipedia Monument in Słubice, Poland (2014, by Miłan Hakobyan) Wikipedia's content has also been used in academic studies, books, conferences, and court cases.[324][325][326] The Parliament of Canada's website refers to Wikipedia's article on same-sex marriage in the "related links" section of its "further reading" list for the Civil Marriage Act.[327] The encyclopedia's assertions are increasingly used as a source by organizations such as the US federal courts and the World Intellectual Property Organization[328]—though mainly for supporting information rather than information decisive to a case.[329] Content appearing on Wikipedia has also been cited as a source and referenced in some US intelligence agency reports.[330] In December 2008, the scientific journal RNA Biology launched a new section for descriptions of families of RNA molecules and requires authors who contribute to the section to also submit a draft article on the RNA family for publication in Wikipedia.[331] Wikipedia has also been used as a source in journalism.[332][333] often without attribution, and several reporters have been dismissed for plagiarizing from Wikipedia.[334][335][336] In 2006, Time magazine recognized Wikipedia's participation (along with YouTube, Reddit, MySpace, and Facebook)[337] in the rapid growth of online collaboration and interaction by millions of people worldwide, pp. 233–242. ^ Scheeder, Donna (15 January 2016). Chicago; New York City: Association for Computing Machinery. ^ "L1b1Ref". Zereography. Individual contributors, also called editors, are known as Wikipedians. The user interface and part of the content of the Domesday Project were emulated on a website until 2008.[385] Several free-content, collaborative encyclopedias were created around the same time as Wikipedia (e.g. Everything2),[386] with many later being merged into the project (e.g. GNE).[387] One of the most successful early online encyclopedias incorporating entries by the public was h2g2, which was created by Douglas Adams in 1999. SZCID 146452625. Archived from the original on June 22, 2018. ^ "In UK, rising chorus of outrage over online misgyny". Retrieved December 26, 2021. {{cite web}}: CS1 maint: url-status (link) ^ Rayman, Noah (July 30, 2014). ISBN 978-1595931351. ^ "Jimmy Wales". Biography Resource Center Online. ^ Stallman, Richard M. Retrieved March 10, 2013. Archived from the original on August 14, 2004. Originally, rules on the non-English editions of Wikipedia were based on a translation of "the rules for the English Wikipedia". The foundation relies on public contributions and grants to fund its mission.[237] The foundation's 2013 IRS Form 990 shows revenue of \$39.7 million and expenses of almost \$29 million, with assets of \$37.2 million and liabilities of about \$2.3 million.[238] In May 2014, Wikimedia Foundation named Lila Tretikov as its second executive director, taking over for Sue Gardner.[239] The Wall Street Journal reported on July 1, 2014, that Tretikov's information technology background from her years at University of California offers Wikipedia an opportunity to develop in more concentrated directions guided by her often repeated position statement that, "Information, like air, wants to be free".[240][241] The same Wall Street Journal article reported these directions of development according to an interview with spokesman Jay Walsh of Wikimedia, who "said Tretikov would address that issue (paid advocacy) as a priority. Retrieved April 26, 2022. "Why Do So Few Women Edit Wikipedia?". 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