



AN EXHIBIT OF INFERIORITY: THE CONTOURS OF GENDER SCIENCE

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Abstract

This is an introduction to a distinct perspective on the subject of varied experience of science by both the genders since early modern times. In the research paper that follows, I attempt to offer helpful contexts in which key concepts, science and sex, are discussed, relevant historiographies detailed and particular, enlightening case studies presented. This special outlook shows, taken in its entirety, that gender science – including both men and women - was diverse and debated during the eighteenth century and that while there were almost exclusively men in formal scientific institutions and publishing houses, their gender relationships were varied. Numerous women still made significant contributions as practitioners and patrons in scientific research.

INTRODUCTION

In this paper, the Scientific Revolution is seen as a unique movement to explore the universe of nature. Overall, one approach to cover the world in which we exist is to state that society and nature consist of people. In the context of a hunting and recovery method of existence, now traceable about 2.5 million years ago, it is acceptable to link the beginning of human knowledge, knowledge of the inanimate and animate nature (stones, animals, plants) and the capacity to systematically manufacture tools/arms. The technological revolution in the twentieth century decreased the significance. It, therefore, reduced transaction and information costs of the geographic, economic, social, and political obstacles that enhanced productivity and development and increased the citizens' capacity for governance. (Dutta et al. 2015) Not just democracy, but the market economy was driven by it. The communisation of labour, the breakdown of traditional family patterns, and the separation of work and life, which distinguish between production and reproductive activity and reduce women's financial position, significantly affect social interactions, particularly gender issues.

One can only guess how the technology revolution in the twentieth and twenty-first centuries eventually affects the relationship between the sexes since we are still changing towards an utterly digital culture. The empowerment or decreasing capacity of Information and Communications Technology (ICT). (Buskens and Webb 2009) (Hilbert 2011) among women is seen in various ways. The promise to eradicate women's participatory and organizational obstacles and three centuries-old gender inequities seems to be simple in new technology. However, the gender difference in access and use shows that women cannot use new technologies' empowerment potential simultaneously as men. ICTs gendered socio-cultural and economic context and the new technologies' gendered design and regulatory framework prevent ICTs from developing their women's empowerment potential. (Hilbert 2011)

Men and Women of Science

Scholars since the 1970s have drawn much-needed information on women's scientific achievements from the seventeenth and eighteenth centuries. Today, some better-known examples are Laura Bassi, Emilie du Châtelet,

Margaret Cavendish, Mary Wortley Montagu, or Caroline Herschel. Feminist historians continue to get merited attention in some disciplines, especially botany and astronomy since they want to offset their erasure throughout the interminable decades of androcentric history. (Hadot 2006) Gender and science studies have, while exceptions exist, typically focused on the historical processes of the systematic exclusion of females from the most formal scientific organisations. However, as Jordanova notes, the distinction between gender and forgotten women scientists and their lost voices is important. Intellectually, politically and emotionally, they are separate enterprises. There are, of course, instances in which women practitioners disrupt the status quo by their mere existence or question the gender science assumptions and practices. However, this does not always happen.

Examinations of women's ideas and practices should thus not be folded into gender history; this is to reproduce 'significant imbalance under the sexual aspect,' which was apparent in how women were called 'sex' in anglophone literature of women in the eighteenth Century.

Notwithstanding, gender is a crucial instrument of studying the social settings of Enlightenment Science, particularly the early formalisation of scientific disciplines and the kind of involvement accessible to and developed by men and women of different characters and identities. (Wagner et al. 2019)

Mary Terrall highlighted the significant difference in the sex of 'the Parisian Salons of Philosophical, Literary and Female Production' and of theme-dominated space of the Royal Academy of Sciences, in Paris where 'no formal stipulations had to be made concerning exclusion for women from membership rolls.'

The thoughts and actions of the women with a scientific sense penetrate the boundaries of institutions in Europe in the eighteenth century. Even so, and many of the articles indicate here, the hetero-social quality and the social advantages recognized by polite domestic Science led to cooperation and interchange between the sexes. Women created their organizations; clubs blended science and politics with ideas of radical friendship, both with men and women. (Cunningham 1988)

There were different scientific activities (salons, universities, theatres, parks, museums, cabinets, and experiments) and communications (periodicals, newsletters, gatherings, lectures, and drawings) in various areas. Furthermore, of course, sex was a crucial factor in whether individuals were given access to science and school, vocation, ethnicity, and religion. (Dear 2001) Examples of university graduate women are very rare, like Dorothea Christiane Erxleben of Quedlinburg and Dorothea Von Rodde-Schlözer of Göttingen. Although Schiebinger points out in her article on astronomer Maria Winkelmann, craft traditions, like the illustration, 'fostered the involvement of women in science in Europe during the XVII century, it was counterbalanced by other, both ancient and new tendencies.' At this time, Winkelmann was seeking the formal appointment to the Berlin Academy, which issued several astronomy pamphlets, and named the Prussian Royal Society of the Sciences the living means to which she ultimately denied in 1712 after 'one and a half years of active appeal'. (Chico 2018)

The privilege of science, like that of their husbands, is generally dependent on the support of male families or husbands for bourgeois and higher-class women. Though most of them are known to participate in domestic science, more cases are feasible in families and social groups in unknown cooperation. It is frequently frustrating to have written scientific articles. The Danzig astronomer Elisabeth Hevelius and her far older husband, Johannes Hevelius, completed her imposing professional music astronomy and published it after his death under her husband's name. However, her work in her depiction on the great Sextant in *Machina Coelestis* is shown in contrast to that of her husband. (Jager 2007)

It was not necessarily good when women's scientific achievement was recognised. From 1790 Caroline Herschel, who had found several comets, was granted a grant of £50 a year for her work alongside her brother George III, court astronomer William Herschel. A print titled 'The Female Philosopher smelling out the Comet' depicts a lady interested in astronomy observations; Herschel is the clear target here. By manipulating the national hierarchy of the senses, it implies that a woman philosopher cannot realize the vision that is essential for empirical illumination. The moon sniggers in collaboration with farting, cherubic Zeus, in exchange, reveals nature is debasing. A sextant and another scientific tool, maybe a mercury thermometer or barometer, (Schiebinger 1988) with a spermatic squiggle between her beings is discarded on the ground. Her misidentification of the comet as a meteor reinforces the suggestion of stupidity in the 'strong sulfur' posture of the Female Philosopher. That is, of course, self-defeating; the print stinks of crude sexism are in their sensory terms a flagrant emission of uneasiness on account of scientific excellence while harmful. (Jordanova 1993)



Fig 1 : The Female Philosopher smelling out the Comet

The Complex Concept of Empowerment

The word 'enhancing' is often used to describe the possibilities offered by ICTs to improve the status and position of women in our society. Empowerment, though, is a problematic notion. The distinguishing between practical and strategic gender demands of Carolyn Moser is a helpful paradigm to analyze the different impacts of ICTs on women. If women utilize ICTs to better deal with their triple responsibilities to meet their gender demands in practice, ICTs may even strengthen the sexual division of labor and existing inequities. However, suppose ICTs challenge our societies' conventional gender roles, thus meeting their strategic requirements. In that case, ICTs may be a vehicle for actually transforming empowerment that changes the balance of power to support women. It is claimed that addressing gender demands in practice may be the first step to sensitize people on the strategic interests of sex since the improvement of knowledge and self-esteem can destabilise gender norms that are socially accepted. (Hassanin 2002) (Buskens and Webb 2009) (Aminuzzaman et al. 2003)

A third conceptualisation addresses the empowerment or the feeling of empowerment out of the perspective of the oppressed woman. Empowerment here is the capacity to make purposeful choices in life that inevitably reflect the community's standards and values. Because of the high societal standards of women's seclusion (purdah) and her desire to maintain their position and dignity inside the family and the society, a woman in Bangladesh chooses economic activities in her house instead of outside work.

To empower women 'from within' to understand their subordination to society, the injustice they meet with, and their capacity for change and enable them to influence their lives and processes that create their lives is essential for transformational empowerment in all areas of society. It is also necessary to raise awareness among men of women's subordinates and injustices; otherwise, they will not be ready to relinquish areas of power and influence.

If ICTs are to attain transformational empowerment, their usage must translate the sexual power dynamics of our society into greater equality for women. However, the way the new technical revolutions have developed

shows that the possibilities provided by ICTs do not benefit women equally with males. The ICT revolution thus runs the danger of strengthening our societies' persistent inequities. (Rathgeber 2000)

The Science of the Sexes

A generation, which now includes sexuality, reproduction, and sex, was one of the main themes of the eighteenth-century investigation (as evident from the articles by Karen Holland and Raymond Stephanson). The generation of works frequently discussed the differences between the bodies of women and men. Laqueur and Schiebinger found differences in their important research on the history of sexual dimorphism in genitalia and bones, respectively. (Terrall 2015) The anatomy of the eighteenth Century mirrored social and political changes into a mutually defined differentiation. In particular, about selection and the interpretation of source material, these claims have since undergone much criticism, debate, and review. The eighteenth century as a formative era for such biological theories was, nevertheless, supported by subsequent historical exams of medical and scientific concepts of sex differences. During these times, genitalia in visual forms, dissections, prints, and patterns - were abundantly represented anatomically, ranking between medically objective and visually seductive.

The significance of scientific categories of gender has not been restricted to men and women. However, it has been drawn into a broader scheme that has coloured the whole natural order: from the recently found microbial world to the huge nomenclature of all forms of life. Even the newest research on 'electric fire', the 'masculine fire' is handled with crackling and considerable power, and the 'feminine fire' is a glossy emanation without violence and percussion," according to Christian August Hausen. (Teute 2000)

Sex was a useful and almost universal lens for nature observation. However, in the eighteenth century, the lineage of human sexual difference was quite different from what it is today: the lingering notion of humoral permits menstrual men phenomena; microscopic forms of female and male seed were relatively new observations, and their properties were generally unknown. (Gevirtz 2014) Natural philosopher and physicians have also taken particular notice of apparently disrupted sexual division systems. In the early modern debates about monster and marvels, e.g., in Jakob Ruff's *De conceptu et generatione hominis* (Little Book of Consolation) (1554) and Ambroise Paré's *Des monstres et prodiges* (Book of Monsters and Prodigies) (1575), Hermaphroditism was a major subject. The interests in human Hermaphrodites persisted in the early XVII century as a kind of fascination, shown in Peter the Great's *Kunstkammer* by Yakov, a 'hermaphrodite' and 'living exhibit' dissecting, preserving, and displayed after death.

Some of these writings have rejected the very existence of these distinct sexed bodies, like James Parsons's *Mechanical and critical survey of the natural environment of Hermaphrodites* (1741).

One revelation from history about the scientific dispute over hermaphrodites' is a movement from the issues of nature potential to definitions of pathological categories. In the first half of the nineteenth century, the study of 'monstrous,' 'wonders,' 'brilliant' and 'strange' forms led to the creation of biological teratology and the development of distinct categories of developmental 'abnormalities'. (Mbiti et al. 2011)

Technology is not Gender-Neutral

A variety of variables shaping their truths affect women's capacity to use it. One of the major causes for women's inadequate ICT consumption is the high cost of access to new technologies combined with the low levels of female buying power. In African surveys, 50-70% of non-users mentioned the non-accessibility to the Internet as the primary reason they did not participate, according to the *Affordability Report 2014*. Because of the sexual division of labor, women all over the globe have lower and less-skilled occupations and, on average, earn 30-50% less than men. (Spence et al. 2010)

Mobile Broadband is far more expensive for women		
Mobile Broadband (prepaid handset based, 500 MB)		
Country	as % of GNI p.c.	as % of GNI p.c. adjusted for gender gap at 30% lower incomes
Peru	2.8%	4.0%
Colombia	3.3%	4.7%
Morocco	4.7%	6.7%
Nigeria	5.6%	8.0%
Kenya	7.5%	10.7%
Rwanda	15.1%	21.5%
Uganda	18.2%	26.0%
Sierra Leone	25.1%	35.8%
Malawi	28.1%	40.2%
Haiti	34.1%	48.8%
Mozambique	40.5%	57.9%
Senegal	56.8%	81.1%
Niger	88.9%	126.9%
Liberia	113.8%	162.5%
S. Tomé&Principe	138.3%	197.5%

Fig 2 : Table from Affordability Report 2014

Women's involvement in the productive labor force was only about 58% of the population of developing nations in 2010. Only 20% of urban women and 54% of rural women in the 15-59 age group took part in productivity in 2012.

Lower education levels for women also contribute to the gender gap in ICT since improved education leads to higher-paid work. In addition, training is needed to gain the abilities required to utilize ICTs such as literacy, English language skills, and technology and scientific understanding. In underdeveloped nations, the continuing gender disparity in education and literacy puts women at an impediment with ICTs. The 2011 census statistics from India show that 66% of women are literate compared with 82% in males and 68% in male literacy in 2013, compared to 51% in female literacy in Sub-Saharan Africa. One of the major causes for this difference is gender-based ideology and value systems. The expense of bringing a girl into school rises because of a desire for boys. 23% of girls in India are abandoned before puberty. (Maier et al. 2007)

Infrastructural limitations equally influence the ICT gender gap. Rural regions, primarily owing to economic considerations, are less linked than metropolitan ones. Africa has a shortage of power in 90% of rural people. Since energy continues to be an essential precondition in terms of access to and use of information technology, this energy poverty leads to ICT poverty.

An additional element in the gender gap of ICTs is mental sets. Often women are not acquainted with ICT due to the lack of exposure and do not understand the value and capacity of ICT. (Georgiadou et al. 2007) They are unwilling to access and utilize ICTs, and this lack of exposure may primarily be ascribed to the so-called 'technophobia' of women. (Huyer et al. 2003) Gendered thinking in our cultures helps exclude women from emerging technological nologies. In India, for example, patriarchal standards hinder women's mobility by allowing them to access telecenters or take up work outside India and a society-specific understanding of men and women uses a technology that is typically considered to be a masculine field and women to be 'unable' to deal with it.

Reflections on Recent ICT Initiatives in India

India is the country with the most significant number of ICTs to develop. The current government of Prime Minister Narendra Modi has been engaged in the "Digital India" campaign to turn India into a digitally

compatible society and a knowledge economy. Despite gender blindness in most efforts, some private sector initiatives to address women's access to and usage of ICTs have been attempted. Google started its November 2013 campaign, 'Helping to Get Women Online,' to assist women overcome online obstacles to access knowledge and awareness. The <https://www.hwgo.com/> website teaches women how to use a computer and Internet and how to get access to what is known as pertinent information. The site is accessible in all four regional and English languages and provides an indicator of the free hotline for anyone requiring computer or internet operation. (Kyomuhendo 2001) (Buskens and Webb 2009) (Kabeer 2001)

The literacy criterion does not apply to alphabetized women who make up about one-third of India's female population, (Buskens and Webb 2009) despite the sex-sensitive design of the website. In addition, household and relationship recommendations, childcare, and motherhood guidance target typical urban homeowners and thus strengthen the sex. The site seems mainly intended for urban, literate, non-worker, and married people unaware of using the Internet at home.

Google may have started the 'Internet Saathi' campaign targeting rural women's digital literacy in July 2015 in reaction to this latest criticism. (Dutta et al. 2015) About five million rural females will learn how to utilize the Internet over eighteen months. This does not, however, ensure greater access and use. As we have seen, women's commitment to the digital world is conditioned by other variables such as levels of literacy, social/cultural obstacles, and infrastructural limitations. Unless these criteria are fulfilled, the viability of Google and its partners will most likely be hindered.

Furthermore, these efforts for women alone exclude males from the empowering process and can have no actual transformational effect. A change in the dynamics of gender power in the home and society demands males to give up areas of power and influence. (Deen-Swarray et al. 2012) For this to happen, they must participate in the empowering process and realize the unfairness of female subjugation and the necessity for a female commitment to new technology. (Hadot 2006) (Smith 2006)

CONCLUSION

ICTs can change the power dynamics of our society towards more equity for women via unseen participation and organization possibilities. However, the exploitation of this potential to reach transformative capabilities which challenge traditional gender roles requires a complex approach to addressing the gendered nature of ICTs and the social, cultural, and economic environment into which ICTs are built. Gender in colonial buildings, the oppression of women, and gender inequality must also be tackled in modern society. Gender-sensitive ICT must consider these aspects to improve to have a lasting and transformative impact on women's lives. Research into the history of early modern science, especially astronomy, the first discoveries of visual representation, and optical technology, has led me to many conclusions similar to those reached by the authors, but there are also discrepancies. Like them, I am not in favor of linear modeling that reverberates the genealogy of the Old Testament when interpreting scientific information. I do not think, however, that sexuality is the sole method to convey the emotional part of scientific study. Why not include left-wing asymmetry, the role of metaphor in science, or other methods of solving emotional problems created by unexpected encounters? Gender studies in scientific history certainly enable us to rethink the significant phases of visual culture history. They shape the history of scientific language, build up male impersonal perception models, and reinterpret the function and impact of utopia in the light.

List of Illustrations

Fig 1: The Female Philosopher smelling out the Comet. Image in the public domain, source <https://www.britishmuseum.org/collection/term/BIB294>

Fig 2: Table from Affordability Report, 2014. Image in the public domain, source <https://a4ai.org/wp-content/uploads/2015/03/a4ai-affordability-report-2014.pdf>

BIBLIOGRAPHY

- Aminuzzaman, Salahuddin, Harald Baldersheim, and Ishtiaq Jamil. "Talking back! Empowerment and mobile phones in rural Bangladesh: a study of the village phone scheme of Grameen Bank." *Contemporary South Asia* 12, no. 3 (2003): 327-348.
- Buskens, I., and A. Webb. "African Women and ICTs: Investigating Technology." *Gender and Empowerment* (Zed/IDRC, London) (2009): 1-9.
- Chico, Tita. *The experimental imagination: literary knowledge and science in the British Enlightenment*. Stanford University Press, 2018.
- Cunningham, Andrew. "Getting the game right: Some plain words on the identity and invention of science." *Studies in History and Philosophy of Science Part A* 19, no. 3 (1988): 365-389.
- Dear, Peter. "Religion, science and natural philosophy: thoughts on Cunningham's thesis." *Studies in history and philosophy of science* 32, no. 2 (2001): 377-386.
- Deen-Swarray, M. Gillwald, A. and Morrell. A. (2012). Lifting the veil on ICT gender indicators in Africa, Evidence for ICT Policy Action, Policy Paper 13, p. 2
- Dutta, S., Geiger, T. and Lanvin, B. eds., 2015. The global information technology report 2015: ICTs for inclusive growth. World Economic Forum.
- Georgiadou, Keratso, Gerassimos Kekkeris, and Mary Kalantzis. "Gender and ICT." *The International Journal of Interdisciplinary Social Sciences: Annual Review* 2, no. 4 (2007): 181–88. doi:10.18848/1833-1882/CGP/V01I04/52797, p. 24
- Gevirtz, Karen. *Women, the novel, and natural philosophy, 1660–1727*. Springer, 2014.
- Hadot, Pierre. *The veil of Isis: An essay on the history of the idea of nature*. Harvard University Press, 2006. p.239.
- Hassanin, Leila. "An alternative public space for women: The potential of ICT." *African Women and ICTs. Investigating technology, gender and empowerment* (2009): 77-87.
- Hilbert, Martin. "Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics." In *Women's Studies International Forum*, vol. 34, no. 6, pp. 479-489. Pergamon, 2011.
- Huyer, Sophia, and Tatjana Sikoska. *Overcoming the gender digital divide: understanding ICTs and their potential for the empowerment of women*. Santo Domingo: INSTRAW, 2003.
- Jager, Colin. *The Book of God: Secularization and Design in the Romantic Era*. University of Pennsylvania Press, 2007.
- Jordanova, Ludmilla. "Gender and the Historiography of Science." *The British Journal for the History of Science* 26, no. 4 (1993): 469–83. doi:10.1017/S0007087400031472.
- Kabeer, Naila. "Conflicts over credit: Re-evaluating the empowerment potential of loans to women in rural Bangladesh." *World development* 29, no. 1 (2001): 63-84.
- Kyomuhendo, Grace Bantebya. "14| The mobile payphone business: a vehicle for rural women's empowerment in Uganda." *About the editors* (2009): 154.
- Maier, Sylvia, and Usha Nair-Reichert. "Empowering women through ICT-based business initiatives: An overview of best practices in e-commerce/e-retailing projects." *Information Technologies & International Development* 4, no. 2 (2007): pp-43.
- Mbiti, Isaac, and David N. Weil. "Mobile Banking: The Impact of M-PESA in Kenya, National Bureau of Economic Research Working Paper 17129." (2011).
- Rathgeber, Eva M. "Women, men and ICTs in Africa: Why gender is an issue." *Gender and the information revolution in Africa* (2000): 17-34.
- Schiebinger, Londa. "Feminine icons: The face of early modern science." *Critical Inquiry* 14, no. 4 (1988): 661-691.

Smith, Pamela H. "Art, science, and visual culture in early modern Europe." *Isis* 97, no. 1 (2006): 83-100.

Spence, Randy, and Matthew Smith. "A dialogue on ICTs, human development, growth and poverty reduction: A background paper. The Harvard Forum." *Berkman Center for Internet & Society at Harvard University and Canada's International Development Research Centre*. Retrieved January 31 (2009): 2010.

Terrall, Mary. "Masculine knowledge, the public good, and the scientific household of Réaumur." *Osiris* 30, no. 1 (2015): 182-201.

Teute, Fredrika J. "The Loves of the Plants; or, the Cross-Fertilization of Science and Desire at the End of the Eighteenth Century." *Huntington Library Quarterly* 63, no. 3 (2000): 319-345.

Wagner, Darren N., and Joanna Wharton. "The Sexes and the Sciences." *Journal for Eighteenth-Century Studies* 42, no. 4 (2019): 399-413.