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**Constrating Strategies of French Women in 18th-century Science :
Submissiveness to Empowerment**

Abstract: Marked by the spirit of the Enlightenment, the 18th century offered women new opportunities to gain power in the production of scientific results. French books and journals signaled their visibility as authors of texts in mathematics, chemistry, botany and astronomy. Women also figured in the correspondence of famous male savants, such as Jean Jacques Dortous de Mairan (1678-1771) or Jérôme Lalande (1732-1807), as contributors to many types of scientific products including tables, drawings, maps, and interim reports. Some of them, e.g. Nicole Reine Lepaute (1723-1788) and Marie Louise Dupiéry (1746-1830) were associate members of provincial academies of science. The best known among them, Émilie Du Châtelet (1706-1749) even became the symbol of the “femme savante des Lumières”, as an author of books in mathematics and physics and the only (even to this day) French translator of Newton's *Principia*. She was also a participant in the competition for one of the Paris Académie des Sciences's prizes, as well as an associate member of foreign academies of science (Academy of Bologna, King Stanislas's Academy)

This talk aims to shed light on forgotten french women “scientists” who managed to conduct an “invisible career” in science by submitting themselves to the then prevailing social rules of partial gender segregation. Essentially, they agreed to work as sub-contractors for male mentors who were themselves direct contractors of the formal institutions of scientific knowledge. In this manner, the women often remain “invisible” though their work was incorporated in major projects which conferred power upon their formal scientific producers. Still, the women’s rise to authorship and membership in provincial academies of science, however rare, signaled a measure of relative empowerment in comparison with previous periods. Their significant role in scientific production was made possible by the fact that prior to the intense professionalization of science in the 19th Century most men and all women continued to do science from a base in their households, or sites into which women were more easily included. The talk will further examine the impact of Mme Du Châtelet's achievements on her female contemporaries, or prior to her acquiring an “iconic” status

in feminist historiography.

Talk : The aim of my talk today is to illustrate the diversity of strategies, some french women applied in 18th century France to take part to science's production. Through four case studies, I will try to show how these strategies used submissiveness to social rules to some extent, in order to gain some power. I will describe the kinds of power they gained and their limits. I will also question the image of *la femme savante* of 18th century France, incarnated by Émilie Du Châtelet, and its influence on these four other women.

First of all, let me remind you of the context of Enlightenment about women and science in France. This period is marked by the development of science's public lectures given either in institutional places like the *Jardin du roi* , or in private houses for example in the case of the chemistry class of Rouelle. The enthusiasm for science was such that, thanks to the development of printing, the number of science's journals and science's books increased. As there was no science teaching for girls at that period in schools or even at home in most learned families, these new medias of science were an opportunity to discover science for the women who would have some interest in it. If so, they would have to overcome several obstacles to take part to science's production. The first one, as I mentioned earlier, was the lack of education in science which at that time was regarded as a male topic. Here appears a second one, the social gendered rules which imposed on women to be discreet, witty (*Esprit*) but not *Savante*, and not to exceed her husband. In case, a woman would have been successful enough to overcome these difficulties, and succeeded in practicing science by herself, she would have needed money to publish her work, or even to have access to books. It is hardly that any woman could have managed this *tour de force*, on her own. At one point in her path she would have needed male savants's **support** and money. Let's suppose some of them would have reached this point of publishing their own science's book, they would have to face the reality that there would be no institutional position for them (in the Universities, in the Paris *Académie des sciences*, in *Collège Royal*...). Despite so many impediments, we know at least that one did it : Émilie Du Châtelet, who since her death in 1749 and even before incarnates the persona (in the way Lorraine Daston and Otto Sibum define it) of *femme savante des Lumières*. This 18th century *heroine* of science's access for women belonged to a very rich and prominent family, by birth and marriage, some key elements to overcome obstacles to reach science's production. Even if some savants of her time, like Clairaut, accepted her as a *Savante*, the portray they transmitted to us is the one of a Monster, in its etymological sense, that is a prodigy, a miracle, someone out of standards, unique !

Her enemies described her as being physically a monster, like Mme Du Deffand who wrote she had a “skinny face, a sharp nose, small eyes green like sea, no hips, a narrow chest, big legs, huge feet” and that she became mathematician (*géomètre*) to get over the rest of the women, to become singular that is superior. The Marquise of Créquy saw her as a prodigy of awkwardness with tremendous hands and feet. This uniqueness is also part of Voltaire's words about her : “No woman has ever been so Savante as she was”. This speech associating the few learned women with Monsters, exceptional persons, had already been pointed out in 1723 (before any publication by Émilie Du Châtelet) by Priscille de Catelan. She wrote : “*The persons of my gender can only distinguish themselves by Beauty, by Witticism and by Virtue. The value to which all other glory appears languid, is proper and peculiar to men: if the merit of this character is sometimes found in persons of my sex, it is in them a **prodigy** which is a **monster** : it is rather, something **singular** and **extraordinary** than great and beautiful. So women must be beautiful or graceful. Men, among the privileges they have given to themselves, were exempted from such duty; but they have imposed it to us; so that it seems that we harm them when we fail.*” While becoming Monsters of Science, how could women like Émilie Du Châtelet become inspiring to other women, “women in the standards” ? And to what extent ?

Let's have a look to the path of four women who had four specific practices in science production. First, Marie Anne Victoire Pigeon d'Osangis, who was bred amongst astronomical instruments made by her father. She was not part of nobility, nor *bourgeoisie*, but her father was a gifted and self-learned craftsman, whose instruments attracted kings, princes and savants. At age 15, she was already able to explain how to use the moving spheres of her father to the varied public (nobility, churchmen, scientists...) who came home or she visited with her father. Becoming an orphan of her father at this age, she started to study mathematics, natural philosophy and physics with Pierre André Leguay de Prémontval, a student of her father, already well-known for his public lecture in mathematics in Paris. Jean Pigeon, her father, had asked Prémontval to take care of her education, so that, as the eldest of the family, she could financially support her brothers and sisters. He wanted her to have a “career” in mathematics, suitable for women, that is to become a mathematics teacher for women, as the century offered this new opportunity because of the women's craze for science, as wrote Prémontval to the duke of Orléans in 1743. And that same year, she became a maths teacher during Prémontval's lectures. She was addressing a male audience of at least 60 persons under his responsibility, on the black board where she was explaining arithmetic and trigonometry. She also wrote the manuscript of a book, published six years later, which made her an author in science, though her book is often presented (even by her) as the biography of Jean Pigeon. In fact this book also develops the thoughts of Jean Pigeon in physics and natural philosophy, from very few notes he

left and that Marie Anne Victoire demonstrated by herself using Descartes, Leibniz, Newton's theories. Half of her book is natural philosophy! Unfortunately, these two new sources of empowerment for her remained unexploited for several years, as she had to flee in 1744 abroad with Prémontval (because of religious reasons, and scientific quarrels), she married in 1746. During several years, she worked as her husband's assistant, writing, reading and correcting his books' manuscripts or articles as he was becoming blind. Eventually, she was able to teach steadily around 1752 when her husband became a member of the Berlin Academy of Science and opened a boarding school. All these years, she submitted herself to the gendered social rules which tacitly required from women in science to declare publicly themselves inferior to men, but using her submissiveness to condemn these rules. As in the preface of her mathematics dissertation, where she declared : "Gentlemen, I clearly see how odd my present step is. A general prejudice seems to prohibit my gender from the Sciences' sanctuary, and I undertake to make a profane foot in it, I that weakness and skills should put aside from it more than anyone else. Maybe, that is the reason why I am the one to disclose this unfair prejudice...." This preface in a science's book, written by a protestant woman, published in Netherlands, is very close from the preface by Émilie Du Châtelet of the translation of the *Fable des abeilles*, never published, where she wrote "I feel the whole weight of the prejudice which excludes us so universally from sciences [...] Women will have the right to protest against their education". Did these two women ever met ? Probably not, and I have no clue about it. One fact is sure, Marie Anne Victoire Pigeon knew quite well Émilie Du Châtelet's work, and she even used her as a landmark in physics about the *Forces vives* dispute with Mairan (in 1741). She described the protagonists of the dispute this way : "In Germany, the famous Wolf, in France, the illustrious Marquise Du Châtelet, the glory and pride of our gender, source of respect and emulation for savants, are the advocates of this view, who contributed most to give credit to it." I would say Émilie Du Châtelet, probably served as an incentive woman for Marie Anne Victoire Pigeon (19 years old when she wrote her manuscript), who had clear consciousness of the limits imposed to her gender by society.

Let's turn now to one of the most invisible french women who took part to science production during the first half of 18th century : Angélique Delisle, daughter of a famous historian, sister of great astronomer Joseph Nicolas and illustrious geographer Guillaume. This "walled off" Savante is only known through her active and passive correspondence mainly with her brother Joseph Nicolas who left France to Russia for twenty years. Through years, Angélique Delisle, observing like Marie Pigeon, the gendered submissiveness in her relationships with savants and political character, acquired many functions in the management of the family's science properties, while her brothers were abroad. Not only did she serve as a transmitter of scientific news (like new books, new

articles, new decisions in the *Collège Royal* or *Académie des sciences*), but she also got in charge of her brothers' career management. As they were away, she made sure they would not lose their pensions in the Académie and/or Collège, by gathering scientific supports like Fontenelle, Couplet or Buache and political ones such as the Comte de Quélus (a regular at Court), the Père Linière (Louis XVth's confessor), the Comte de Maurepas (the Navy's Minister) through campaign. She received power of attorney from Joseph Nicolas to deal with all kinds of matter concerning his properties, such as the money received from the Academy, the buildings he was using in the Luxembourg, the astronomical instruments there, the books and journals he owned, the publication of their father's manuscripts. Angélique Delisle even sent several letters to Joseph Nicolas where she first advised him how to act with the Academy about his work in Russia, and then lectured him about his lack of willingness to defend his position. Her brother obeyed her at first and he let her in charge of dealing with the transmission of some of his data. When the famous astronomer came back to France, he was hoping to get back to his previous life with his sister. That is to be in charge of her, as she was still single and orphan of parents (she was around 50 years old). But Angélique Delisle had led her life as she meant to (obeying gendered social rules) for 20 years without any male *chaperon*, she had ruled part of her family astronomical, historical and geographical business by herself and defended it by campaigning amongst scientists and nobility, so he had no longer power of decision on her life. But his return marked the end of her activity in science networks, and a few years of struggle with her brother to keep control on her life.

At the end of the 18th century, Victorine de Chastenay, well-known by historians of french Consulat and Empire (for her Memoirs), and in literature (for her french translation of *Mysteries of Udolfo* by Ann Radcliff, 1794, considered the quintessential gothic romance), is never regarded as a scientific woman or *Savante*. However, she had a steady education in science thanks to her father, very fond of these matters and friend of many savants like Fourcroy in chemistry, Charles in physics, Jussieu and Desfontaines in botany....Not only the young Victorine discussed science with these men, but when grown-up, she dedicated part of her time to private and public lectures in astronomy with Arago, chemistry with Chevreul, physics with Humboldt and her favorite topic botany with Cuvier. She was welcome to experiment in the botany lab of the Museum with Desfontaines and Candolle, and spent many years to develop, observe and analyse her own botanical garden in her castle of Essarois. This forgotten Savante was able to do so by herself because, first she belonged to old french nobility (but with not much money) and second at age 14 she was elected chanoinesse of the Chapter of Epinal, which gave her a regular pension, a great position in church, and no obligation to get married, or make vows. That way becoming Madame de Chastenay, she was out of reach of any grasp on her old genealogy, and free to live the way she wanted. Even if the french Revolution

destabilized her position, she became a famous character of Consulat and Empire court, friend of Joséphine, Napoléon's first wife, Chaptal (Prime Minister), Fouché (Minister of the police)... She was part of a very important intellectual network, exchanging with Chateaubriand (writer and minister), De Sacy (linguist and orientalist), Bernardin de Saint Pierre (writer, *Paul & Virginie*)Surprisingly, Victorine de Chastenay, who published six books about history and literature, just wrote one about botany, mixing poetry with botanical descriptions...maybe to submit to gendered social rules ? Why this woman who wrote hundreds pages of manuscripts in science (like books's summaries and analysis, botany's observations and experiments, a geometry for herself and so on) never published these writings, but only her historical and literary ones ? She was master of her life, she had enough money to publish, she had powerful and learned friends and she was respected ! Her position was such that she helped many male students to study by financial support and recommendation letters, and became as she called herself the *protectrice* of Valentin Haüy, who created the Blind persons institute in Paris, writing for him letters to the powerful members of the french *Assemblée* and of the Paris division. It is very difficult to understand while reading her Memoirs, where she writes: “I write to be read one day”, or “The thought of being nothing when merit was going to be everything prevented me from closing my eyes; I was reading instead of sleeping [...] Keep it clear, I was passionate about glory, and only glory.”, except by admitting that science was not a good way for women to reach glory. Victorine de Chastenay is clear about two points in her writings: first, she needed freedom and studying was a way to reach it, second she could not stand, even if she had to publicly bore it, the lack of education for women imposed by society.

My last case study deals with Marie Louise Du Piéry

Through these examples, we clearly see that power in science production in 18th century France was reachable for women as long as they submitted themselves in publications and communications to gendered social rules. Some acquired mundane power through their political / or learned / family networks such as Victorine de Chastenay, becoming patrons of scientists or being involved in their election in academies. Some were able to choose their own life and take their own decision, through the management of men's careers in science, as Angélique Delisle did. Others, like Mrie Anne Pigeon dedicated themselves to give access to science to women, by teaching or publishing. So they adopted varied empowerment strategies to be able to take part to science, acting from domestic spaces, like their home or a male scientist's one, from public spaces like court, salons, public lectures, and even from institutional spaces like the Museum, the Collège de France or the Paris observatory. These pioneers, though invisible nowadays, were perfectly integrated to the scientific

networks (as I showed 3 years ago in Manchester, ICHSTM), and we should wonder why they did not reach Émilie Du Châtelet's status. Probably because the former was the most exceptional of them, in number of science publications, in number of archives, in social position.... So History (firstly written by men) reminded the Monster, and forgot the standards...So I wonder which of these two kinds of women can help young girls and women to imagine themselves working in Science.