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Trying to keep afloat: the unchanging situation of women in science in France?

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This working paper is an update on the place of women in science in France in 2012, following on reports for the European Commission's expert groups Women in Decision-Making (Wirdem – which produced *Mapping the Maze*) then Gender and Excellence (which produced *The Gender Challenge in Research Funding*). It is a somewhat discouraging exercise: the situation has barely evolved in spite of - or because of? - the massive reorganisation of French academic structures over the past 5 years. In the present paper, I shall first draw a quick picture of the present state of the public research system – a difficult task because it is still evolving rapidly. Then I shall provide some elements concerning the situation of women in general before focussing mainly on that of women in academia. Finally, I shall discuss the major public debate (Assises de la Recherche) that is presently being carried out first on the Web, then publicly, 26 and 27 November 2012.

Within Western Europe, France often appears as an ‘average’ country, intermediate geographically but also sociologically between the Nordic and the Mediterranean countries. It is often close to its neighbors and/or to the EU average in opinion surveys. France appears to be average on the Women in Science issues too. The proportion of female researchers, all sectors included, is close to the EU-15 average (28% in France and 29% respectively, 35% and 36% in higher education). There is also an average proportion of women in Grade A academic positions (19 % and 17 % respectively) (EC, 2009b). Why then does the country appear to be getting so far behind on Women and Science (W&S) issues (see for instance the discussions in EC, 2008, 2009a and earlier studies such as Osborn et al, 1999; Rees, 2002; Xie and Shauman, 2003; EC, 2004, 2005)?

Perhaps the reason we get this impression is simply that France is not moving forwards, as many of its neighbors are. While proportions of women in research have increased in Europe, over the past decade, France has slightly regressed. The proportion of grade A female academics has barely changed in the past few years whereas it doubled in Switzerland and was multiplied by 1.5 in Germany, as we shall discuss below. In what follows, I shall attempt to provide some elements to help understand this situation.

Organisational changes

A few words first on the French research system. The country has a strong research tradition but has trouble increasing its R&D spending to reach the "Lisbon target" of 3% of its Gross Domestic Product. It reached 2.26% in 2009 after a long stagnation (it was at 2.32% in 1990). The system is characterized by a relatively strong civilian public sector which employs

approximately 39 800 women researchers (i.e. 33,4% - 32.0% in 2003) and 79 200 men researchers. The business sector employed about 30 900 women researchers (19.9% - 20.3% in 2003) and 124 700 men (Data for 2009, http://www.insee.fr/fr/ffc/chifcle_fiche.asp?tab_id=206 accessed 16 November 2012), mainly concentrated in major industry: automobile, pharmacy, telecommunications and aeronautics.

In the Universities, which are practically all public, teaching and research personnel have heavy teaching charges (about 200 hours per year, not including preparation, administration, etc.). Numerous "grandes écoles" or engineering schools form students but many are not very active in research (except for a few exceptions, like the Ecoles normales, the Ecole polytechnique or the Ecole des hautes études for the social sciences). Research organizations play a large role in French research: although they employ fewer people than the Universities they represent a big task force since they can do research full time. The CNRS (Centre National de la Recherche Scientifique) is the largest among them – indeed it is the largest research operator in Europe. At the end of 2010, it employed 25 630 permanent personnel. A number of smaller, more specialized research organizations exist alongside it (in medicine, agronomy, computing etc.).

In the public sector, the majority of personnel hold tenure. However, the number of temporary doctoral or post-doctoral positions has rapidly increased over the past few years with the development of competitive funding by project. This has provided many more job opportunities for young PhD's than there used to be in France, but has brought on a great deal of job instability that hits young women (and young men) just at the time when they could be founding a family.

The French public research system -after a profound crisis in 2004 when hundreds of laboratory directors symbolically handed in their resignation - has undergone enormous organisational changes. Strong pressures coming from the Bologna reform and EU funding requirements have pushed to adjust to international norms. The Shanghai ranking of universities caused a profound shock. Post 1968, French Universities had been divided up with, for example, three in Strasburg, Marseille and Toulouse or thirteen in Paris and its suburbs. None of these relatively small universities ranked high on the Shanghai list and that caused a sudden rush to regroup them. An enormous upheaval is now taking place in a number of universities because of this.

Another part of the general reorganisation was the move to make universities autonomous – they used to be state-dependant, and in fact still are for the vast majority of their funding. To allow this to happen, a new law on research (Loi relative aux libertés et responsabilités des universités – Law on the liberties and responsibilities of universities, LRU) was passed in 2006. Following that, an independent evaluation agency (AERES, <http://www.aeres-evaluation.com/>) and a competitive funding agency, the National Research Agency (ANR, www.agence-nationale-recherche.fr/en/project-based-funding-to-advance-french-research/) were also created the following year, in 2007. All this has brought on profound changes in power relations and in resource-sharing academia. Perhaps not surprisingly, women do not seem to have gained much in the battle!

The situation of women in France

Before considering women in research, I would like to point out a few elements that indicate a possible worsening of the position of women in France in general. This question would obviously need more systematic researching but there are some worrying signals. The 2001 Helsinki report for France (<http://cordis.europa.eu/improving/women/reports.htm>) pointed

out that the context was generally favorable to women, in particular with numerous crèches (20% of small children attend them), free whole-day schooling available for children from age 2 on and tax deductions covering about 50% of the cost of childcare or housekeeping costs - a strong restriction being that these tax deduction do not help people with incomes too low to pay taxes. However, over the past 10 years, the opportunities for the schooling of two-year-olds have plummeted: the proportion that age group that benefits by them has dropped from 34% to 12%. This leads a lot of women to take a break in their career or to work part-time. Women's activity rates are average for Europe: in 2011 they were 66.2% and 74.8% respectively for women and for men (Age 15 to 64, http://www.insee.fr/fr/themes/tableau.asp?reg_id=0&ref_id=NATCCF03170 accessed 15 November 2012).

Another cause for worry is the evolution of France's Global Gender Gap Index (<http://www.weforum.org/reports/global-gender-gap-report-2012> accessed 15 November 2012). The country is now at the 57th position out of 135 countries. It had reached the 15th rank in 2008 - unfortunately, its index has been dropping ever since (see table below – note that the number of countries ranked has slightly increased over the period).

Year	2012	2011	2010	2009	2008	2007	2006
Gender gap index	0.6984	0.7018	0.7025	0.7331	0.7341	0.6824	0.6520
Rank	57	48	46	18	15	51	70

Table 1: Gender gap index for France (Data from Global Gender Gap report, reference above)

France gets top scores on 'Educational attainment' and 'Health and survival'. On the other hand, it has two weak areas, one of which is 'Political Empowerment': the recent drop in score was mainly due to a decrease in the percentage of women in ministerial positions. The new government set up in May 2012 is, for the first time ever, exactly gender balanced so this point will no doubt improve. The other weak factor, practically stagnant since 2007, is 'Economic Participation and Opportunity'. Within it, wage equity, and the place of women in decision-making and income are, in that order, the worst elements – these are dimension that directly concern us here.

Women in science

If we now focus on women working in science professions, our suspicion that France is at best standing still – and perhaps slipping backwards – is confirmed, at a time when many comparable European countries are moving ahead. (For earlier studies on the French situation, see Boukhobza et al, 2000; Barré et al, 2002; Crance and Ramanana-Rahary, 2003; Hermann and Picq, 2005). Growth rates of numbers of scientists (all sectors) in France between 2002 and 2006 were +3.1% for women and +3.2% for men, when the EU-15 averages were +7.1% and +3.7% and EU-27 averages were +6.3% and +3.7% respectively (EC 2009b). In other words, while proportions of women in science were increasing in Europe, France was slightly regressing! If we focus on the Higher Education Sector, the proportions are low, but better balanced (+3.4% for women, +1.7% for men) (EC 2009b).

The problem appears early: only 43% of all PhD's were delivered to women in 2009 when the EU27 average is 45% and the United States are at 52% (EC 2012). In fact, it looks as though, compared to its neighbours, France isn't providing a sufficient recruitment pool of women. This needs more researching – when are women students disappearing and why? The

president of one of the major science universities, University Paris VII Denis Diderot, quotes figures for mathematics: 31.3% women in second year of Master but only 19.4% preparing a thesis (interview June 2011, <http://www.amue.fr/presentation/articles/article/parite-homme-femme-dans-le-monde-universitaire/>). They really seem to be balking at the perspectives of a research career!

Of course, sheer numbers of women in science are only an element of the question – the "glass ceiling" that mysteriously prevents women from moving up the hierarchal ladder is an essential part of the picture. Here again, the situation is barely moving in France. The proportion of grade A female academics gained two percentage points from 2002 to 2009 (going from 17% to 19%) while it more than tripled in Switzerland (from 11% to 37%) and nearly doubled in Germany (8% to 15% for 2010 in this case) and in Austria (9 to 17%) (EC, 2012).

The Ministry for Higher Education and Research provides figures for 2010 for the university teacher-researchers: globally, there are 36.2% women, 42.4% in Grade B (maître de conference) and 22.6% in Grade A (professeur) (<http://www.enseignementsup-recherche.gouv.fr/pid24768/parite-et-lutte-contre-les-discriminations.html>). The problem is that when Grade A and Grade B levels are grouped together, part of the dynamics of the glass ceiling effect are lost: the progressive rarefaction of women as they rise through grade A positions doesn't show up and the difference between the bottom and the top levels doesn't look as bad as it really is. Fine-grained statistics are really needed to understand the problem.

CNRS statistics

CNRS provides very complete information in a specific gender report that it now publishes every year (<http://www.cnrs.fr/mpdf/> accessed 27 November 2012). It includes the year's recruitments but also times series on the presence of women in different positions at all levels - governance, selection committees, permanent and temporary positions – one could simply wish to have the time series disaggregating by discipline. So far, the universities don't publish anything nearly as complete. Compared to universities, CNRS has a smaller proportion of women researchers but a less difference between Grade A and Grade B.

	Total	Grade A	Grade B
Universities	36.2 %	22.6 %	42.4 %
CNRS	32.3 %	25.4 %	37.1 %

Table 2: A comparison of proportions of women researchers in University and CNRS (see references in text)

Women are under-represented among CNRS researchers but not among support staff: at the end of 2010 they made up 42.5 % of the permanent CNRS population, i.e. 65.1 % of lower level support staff, 43.7 % of the higher level support staff (engineers) but only 32.3 % of researchers. These proportions have changed extremely slowly. Indeed, when the CNRS was created in 1946, 30 percent of the researchers were already women (Kaspi and Raimunni, 2004).

Women also have trouble moving up the hierarchical ladder (see table below). Both support staff and researchers are affected, even though their modes of evaluation and promotion differ. The different senior researcher levels (DR – directeur de recherche) are Grade A, equivalent to professor. Junior researcher (CR - Chargé de recherche) is grade B. The global figures in 2010 were 37.1% women among CRs and 25.4% among DRs. However, as I said, it is worth looking in detail at all the levels. Promotion from the lowest level, CR2, to CR1 is in practice automatic. The glass ceiling appears at the passage from CR1 to DR2, a highly competitive bottle-neck. Because of that, women 'accumulate' in CR1, just below the "ceiling". Once that obstacle is passed, moving on up from DR1 to DR1 then to the 'classes exceptionnelles' (exceptional categories) remains difficult and the proportion of women keeps on dropping. (Note that, in 2010, there were only 9 women DRCE2 so fluctuations can be high).

	2007	2008	2009	2010
DRCE2	8,7	10,6	10,2	17,3
DRCE1	15.4	11.1	9.1	9.8
DR1	14.3	14.4	17.0	17.7
DR2	26.6	27.4	27.6	28.3
CR1	38.6	38.7	38.7	38.6
CR2	31.9	31.7	30.5	31.4
TOTAL	31.8	32.1	32.2	32.3
Post-doc	38.0	37.1	36.5	36.5
Doc	35.5	36.7	38.7	38.5

Table 3: Proportions of women per grade in CNRS (CNRS Gender Report 2010)

In 2010, the average age of promotion from Grade B to Grade A was 45.9 years, with a differential in favour of men of 1.5 years. However, the differential was 7 years in Mathematics, between 4 and 5 years in Environment and Ecology and in Nuclear Physics and 3 years in Human and Social Sciences. (These figures can fluctuate from year to year – the populations in the cases quoted here vary from 18 to 47 – so an analysis over several years needs to be done.)

CNRS also has personnel on temporary contracts at doctoral and at post-doctoral levels – the proportions of women are also on Table 3. We can see there that the glass ceiling effect extends below the permanent positions – the proportion of women starts decreasing from doctoral level on up: the population that CNRS recruits is less feminized than the post-docs and doctoral students it employs. CNRS only employs a small proportion of all doctoral students, but they are less feminized than the total population of PhD laureats (43 % women in 2009).

CNRS statistics also allow us to draw some degree of historical perspective from the data broken up per age group for researchers. This is possible due to the fact that people have tenure in CNRS and hardly ever leave the organisation, even for promotion. In 2010, out of 11 450 researchers, 20 permanently moved to another organisation, 10 died and 7 gave up their job (Bilan Social 2010). (Young mathematicians are the exception – for them, the ideal thing is to move to a professorial position in a university. That leaves room for women who don't hit a glass ceiling: proportions of CR and DR are equal). So, because the CNRS pipeline doesn't leak, we can compare generations to get a picture of earlier recruitment practices. The most feminized age stratum is 45 to 49 years with 37.2% of women. In the group 10 years

older, they represent only 33.6%. More surprisingly, they are only 30.0% - in the group 10 years younger.

So, apparently, there was a "golden age" for women, roughly situated in the second half of the 1990s and things have since gotten worse. Indeed, among the CR who were recruited in 2010, only 33% were women when, inside CNRS, there were 37.1% women. This phenomenon of non-replacement of women was most obvious in the sectors of Ecology and Environment, Human and Social Sciences and Information Sciences (again, previous years need to be checked to confirm the tendency). The same phenomenon can be observed for the highest level of support staff (ingénieurs de recherche – research engineers) that recruited 24.2% of women in 2010 whereas the population in CNRS included 30.2% women. The same tendency was true in 2007 and 2008 but was reversed in 2009 with 35.1% women among the recruited.

Recent years have been tougher for women – but not for men. It is often said that women have a hard time when resources become scarce but something different seems to have happened here: opportunities increased but women didn't seem to get their share. Recruitments have increased - here are about 260 fewer researchers in the 45-49 years age group than in the recently recruited 35-39 years group. (Most people are in the organisation by that age: average recruitment age is 31.4 years into CR2). However, this increase in population wasn't evenly shared: the number of men increased by about 230, the number of women only by 30. In other words, men benefitted much more than women by the increase in the number of positions.

This situation is really preoccupying: over the past decade and a half, a period when CNRS was officially taking on board gender questions - the Mission pour la place des femmes au CNRS was set up in 2000 – the place of women was clearly regressing.

Gate-keeping :

Gate keeping activities (Husu, 2004) are very frequently pre-empted by men and there is little reflexion on the subject in France. However, this should change to some degree when new legislation comes into force – a lot of excitement is to be expected! Gatekeepers are all the people who control decision-making and access to resources. They can be members of policy-making committees but also of evaluation committees (for funding, recruitment, attributions of diplomas, etc...).

As discussed in *Gender Challenge in Research Funding* (EC 2009a), the argument for having gender balanced committees isn't simply that they are automatically more favourable to women - indeed various research shows that women can be just as prone to gender stereotypes than men. Getting onto committees makes women more visible within the research system and allows them to get them into networks. It also gives them an inside view of how evaluations and policy-making work, as well as a wider view over research activities in and around their field, that can help them in their own work. This is of course true for both men and women – but it is only fair that women get their share of these benefits. Within an organisation, participation in committees helps "naturalize" their presence, at all levels.

There is plenty room on policy-making boards in France – according to a report of the "Cour des Comptes", the control body for all French public institutions, there are far too many such boards (*La gestion de la recherche publique en sciences du vivant*, <http://www.ccomptes.fr>). The 2006 research law set up yet another one, the High Council of Research. There is also an Academy of Science and an Academy of Technology.

According to SheFigures 2012, boards include on average 27% women – but the figure is for 2002! (see Carisey, 2006 for an extended analysis of their presence).

Here are a few examples of some of the more important policy-making or counselling boards.

- The "Steering committee for the elaboration of the national strategy for research and innovation" that defined the present research priorities in France included 2 women out of 18 (11%), the Chair was a woman.
- The High Council for Science and Technology (Haut Conseil de la Science et de la Technologie, auprès du Président de la République) counts 8 women out of 22 (36%, an improvement compared to 24% in 2009). The Chair is a man.
- The High Council for Research and Technology (Conseil Supérieur de la Recherche et de la Technologie, auprès du Ministre de la Recherche) is one of the very few gender-balanced committees: 21 women out of 44 (48%). Chaired by the Minister, who is a woman. (<http://www.csrt.fr/>)
- The Academy of Science: the Mathematics section includes 2 women out of 26 (8%), Physics section 3 out of 35 (9%), Human Biology and Medicine 4 out of 35 (11%), ... There are slight improvements since 2009 (the figures were 4%, 6% and 10% respectively)
- The Scientific Council of CNRS: 10 women out of 29 27 (37%, 31% in 2009), the Chair is a man.
- The Administrative Council of CNRS: 6 women out of 21 (29%, 4% in 2009), Chaired by the President of CNRS, presently a man.
- Among the ninety-odd university presidents, the number of women has dropped from 14 in 2008 to 8 in 2012. France has practically the lowest proportion of female heads of institutions in Europe, at 6%, tailed only by Turkey and Luxemburg (EC 2012).

Other types of committees evaluate people or projects to allocate positions, funding, diplomas. They work at very different levels: high level policy-making in the realm of evaluation or of funding right down to the visiting committee out in the field or the doctoral committees. Data is easily available for the top-level boards but getting a clear view of lower level isn't easy.

Let us take as an example, the evaluation agency AERES (Agence d'évaluation de la recherche et de l'enseignement supérieur – Agency for the evaluation of Research and Higher Education, <http://www.aeres-evaluation.fr/>). Its President is a man as are the 3 sectorial directors immediately below him. The agency has a main Council (Conseil) made up of 11 women (44%) and 14 men – its chair is male. There are 117 scientific delegates, in charge of organizing the evaluation activity in different disciplines – 32 of them are women (27%). Finally, in the field there are the visiting committees in charge of the evaluation of the different units. Their composition is available in the reports written on the laboratories, universities or teaching units they evaluate – that means a lot of compiling. However, AERES provides some statistics in its annual report (AERES, 2011). The proportions of women experts evaluating whole establishments in 2011 were 21% among the experts and 13,6% among the chairs of the visiting committees. For evaluating doctoral formations, there were 33% women among the experts – the proportion of chairs isn't given. The figures for the evaluation of research units and laboratories aren't given either. A systematic compilation would be useful. Anecdotally, in 2009 my own laboratory was visited by an all male committee. One of our main topics was gender studies...

The same sort of analysis can be carried out on the national funding agency ANR (Agence nationale pour la recherche - National Research Agency). In September 2012, although the director general is a woman, six of the seven heads of scientific departments are (a slight improvement: at the creation of the agency, they were all male). The Administrative Council counts only two women among its eleven members – admittedly one of them chairs it. The ‘Council of Prospective’, with nine members, includes no women and there are none among the chairs of the ‘Scientific Committees by Sector’. One should go on working through the program committees, the call committees, the individual evaluators ... The agency doesn't systematically publish gendered success rates for its funding programs.

Globally the situation is improving – but very slowly! However, there is some hope because a new law will come into effect in 2015. Known as the Sauvadet Law and voted in March 2012, it will impose a minimum of 40% of the minority gender in university councils and in all recruitment and promotion committees within the civil service. However, it is planned that its application will be adapted to the ‘specificities’ of HES and research – they benefited by exemptions under the previous legislation. This reform, if really applied, will bring major changes in the French research system – and, hopefully, in mentalities.

Assises de la recherche

A major public debate about research and higher education is going on at present (Autumn of 2012), set up by the new government. Gender issues are remarkably absent. A search among Internet contributions brings up 4 with the keyword women (femmes), 1 with gender (genre) 1 with parity (parité) and 2 with diversity (usually understood as ethnic diversity). The main W&S associations (Femmes et Science, Femmes et Maths, Femmes ingénieures) contributed the list of 20 propositions that they had initially prepared for the presidential elections of May 2012. Their four main themes are 1) deconstructing stereotypes about women and science; 2) encouraging young people and particularly girls to study science; 3) rethinking the place of science and engineering in education and 4) improving the careers of women scientists, engineers and support staffs.

The new Ministry for the rights of women also contributed a particularly interesting document. It also picks up four main topics, but not quite the same ones: 1) improving equality within universities and research organisations (careers, committees, councils); 2) improving gender balance during training and act on career choices; 3) fighting all forms of sexist violence; 4) developing and disseminating gender studies. Gender studies are less obvious for the W&S associations because it still tends to be seen as a social science question. The Ministry also wisely picks up the question of violence which is not science specific, of course, but which should not be ignored.

Women are depressingly absent from the mainline contributions. For instance the one made by the Conference of University Presidents doesn't include the words ‘women’, ‘gender’ or ‘parity’ - ‘equality’, when used, doesn't refer to men and women. The whole process will be interesting to analyse, but it doesn't look as if the place of women in research will come out as a major topic. As we have seen, the situation in France is remarkably rigid. However, the law that will impose 40% women on committees in 2015 may bring on some change – as long as research doesn't manage to re-negotiate exemptions. There will certainly be plenty of opportunity for further research on this topic.

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Claude Bernard de Lyon I ; Paris Diderot, Joseph Fourier de Grenoble)

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