RE-CLAIMING A POLITICAL VOICE: WOMEN AND SCIENCE IN CENTRAL EUROPE

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WS Debate

SIXTH FRAMEWORK PROGRAMME

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Preface

At the closing of the European Year of Equal Opportunities for All (2007), one can reasonably affirm that the EU is fully engaged in the promotion of equal opportunities as an ethical, cultural and economic pillar of the European way of living.

Importantly, not only equal opportunities can be defended as an essential factor of democratic life, and one of the fundamental principles enshrined by the EU Treaty. Promoting equal participation to the labour market also indicates launching and implementing policies to encourage, monitor and facilitate the full exploitation of the EU workforce, talent and creativity potential.

In the last 20 years the presence of women in science became worldwide a central political issue. The career paths of men and women across all scientific disciplines have been monitored in order to clarify the institutional arrangements and personal preferences that explain the under-representation of women in science. Addressing this under-representation is now part of a strategic approach to enhance EU competitiveness and fully realise the European innovation potential.

Analysis and comparison of national policies, experts advice, exchange of knowledge, promotion of data collection on students and professionals in science are some of the tools used in the framework of the Women and Science objectives. The ultimate goal is the identification of administrative, financial, and political instruments to rebalance the situation of women in science and mainstream gender awareness in scientific research. The 'ENlarge Women In Science to East' (ENWISE) working group was created in 2002 to especially focus on the situation for women scientists in Central and Eastern European countries and in the Baltic States.

The ENWISE report highlighted the influence of the specific gender policies implemented in these countries during the communist regime, such as equal right to and the obligation of full-time employment, full access to education regardless of gender, supplemented by the availability of childcare facilities, legal protection and state support for the working mothers. Despite the limits of some of these policies, they succeeded in increasing the number of women working in science at various level of the hierarchical ladder.

After two enlargements, the social and economic situation of Europe has changed. As much as in other advanced economies, knowledge, innovation and education have been recognised as one of the key drivers of productivity and growth. The challenges set for Europe by the Lisbon Partnership for Growth and Competitiveness require investments on human capital in Europe, including women and men.

Despite the risk that the demographic trends and the declining interest of young people in research careers would dramatically cut the human resources available in R&TD, women remain a clear minority among researchers in Europe. In 2003, they represented 29% of the overall workforce. However, only 15% senior professors are female, a percentage that goes down to 6% in the case of senior academic positions in engineering and technology.

Periodically collected data show us that these proportions are slowly progressing. In the meanwhile, the question of participation of women in science came to be no longer considered as a mere democratic issue, referring to the right to participate and to have a career. Today, the discussion concerns the quality of science that the EU wants to promote. There is a need to investigate not only the ethical issues linked to the scientific and technical development, or the accountability of science in front of citizens and stakeholders, but also the role of gender in the 'construction' of scientific excellence. This will bring the analysis to the core of the scientific process, into the organisation of scientific institutions, their processes, and procedure.

In some European countries, a long-term tradition of equal opportunities and promotion of women in science already brought remarkable results; in others progress has been slower. Each country has its own specificities that need to be analysed and understood. Different countries and/or institutions have focused on different strategies to start a discussion on excellence definition, to raise awareness on the discrimination of women in science, and to increase the number of women in the academic sector, especially in leading positions.

Which strategies and instruments have been used? With which success rate? Are they transferable? Which forms of resistance against gender equality policies recur? The project has identified a number of instruments to promote full participation of women in science, including the creation of national Steering Groups and tasks forces; the use of EU resources to fund projects on women in science; the process of capacity building with civil society organisations that can bring forward cultural and policy change; and most of all political support from European and national elected representatives.

This publication presents the Women and Science picture in the 5 case studies countries: Czech Republic, Hungary, Poland, Slovakia and Slovenia. Much has been done and much needs to be done to achieve significant results and balance inequalities. The European Commission warmly supports projects such as this one, and we would like to thank all those who are contributing to a clearer understanding of the status of women in science in Europe.

Johannes Klumpers
Head of Unit Scientific Culture and Gender Issues, DG Research European Commission

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Introduction

HISTORY: PRE-SOCIALIST AND SOCIALIST ERA

In the second half of the 19th century and until World War I, a large portion of the geographical area covered in this report was part of the Habsburg monarchy and so the educational systems of the countries concerned have borne in many aspects a common historical legacy. **The women question emerged in the second half of the 19th century.** The first academically educated women graduated at the beginning of the 20th century: for instance the first Slovenian woman professor in 1905 in Graz; the first eight Czech women graduated from the Faculty of Philosophy and Arts at Charles University in Prague in 1900.

In the countries under study before World War II **most academically educated women were engaged in medicine, education, pharmacy and law**. For example, in the Czech Republic 1,200 women had graduated in medicine by 1939. Women's grassroots organisation were also active in these countries before World War II. Most well-educated women occupied worse-paid positions compared to their male colleagues.

After World War II, the socialist political system was installed in these countries. Subsequently, the process of industrialisation intensified in most of the countries concerned. This era was characterised by a centrally-planned economy and state ownership. Because of the **disbanding of civil society organisations during the state socialist period,** women's grassroots professional organisations were discontinued. The actions of the state socialist regimes aimed merely at getting women onto the labour market (especially low paying, menial jobs) and thus they did nothing to change the unequal distribution of labour in the household and in childcare. Furthermore, as the former regime supported the establishment of childcare facilities and other services for families, the situation might have seemed to have been solved. Since a lot of these services were abolished after 1989, the burden on women has in many cases increased. Despite the voting right, the participation of women in political life was lower than should have been the case. The lack of civil grassroots activities which are common in Western countries represented a significant factor in limiting the possibilities of women to assert themselves in public life.

Although it was evident that there was a first glance a large number women working in research and development in the late communist era, only a few occupied leadership positions. It was not exceptional that **women had lower wages and supplements than their male colleagues and limited access to technical equipment, as well as the possibility of using the services of laboratory staff**.

During the communist era, government policy proclaimed the equity of women and men and supported their employment, but the glass ceiling was traditionally very low. Women could not defend themselves against societal disadvantages because there were no grassroots organisations and gender issues were underestimated. From this point of view the historical legacy of post-communist countries is different from that of Western countries, where women have been joining the labour market in larges numbers since the 1970s.

Because of the legacy of the state socialist regime, those who are active in the issue of women in science have to operate in an environment different from the old EU countries where women's activism and networks have been functioning since 1970s, if not earlier. This has several consequences: firstly, it is impossible to fully participate in actions such as the European Platform for Women Scientists because there are no legal entities (NGOs and associations) for women in science. Secondly, existing organisations, groups or steering committees have to battle the issue of 'speaking for others' and have to find ways to ensure that the actions they strive to advance answer the needs of women researchers. Thirdly, there may be no 'partner' to push policy debates at national level and in some cases this is done by people working on specific projects (also funded by the framework programme) and the EC's experts.

Related is the issue of poor awareness among policy makers of gender issues since the countries did not experience any societal debate about women's rights in the 1970s. Therefore, the idea still prevails that the issue is one of women's choices, not of structural and institutional barriers to women's advancement in research and development.

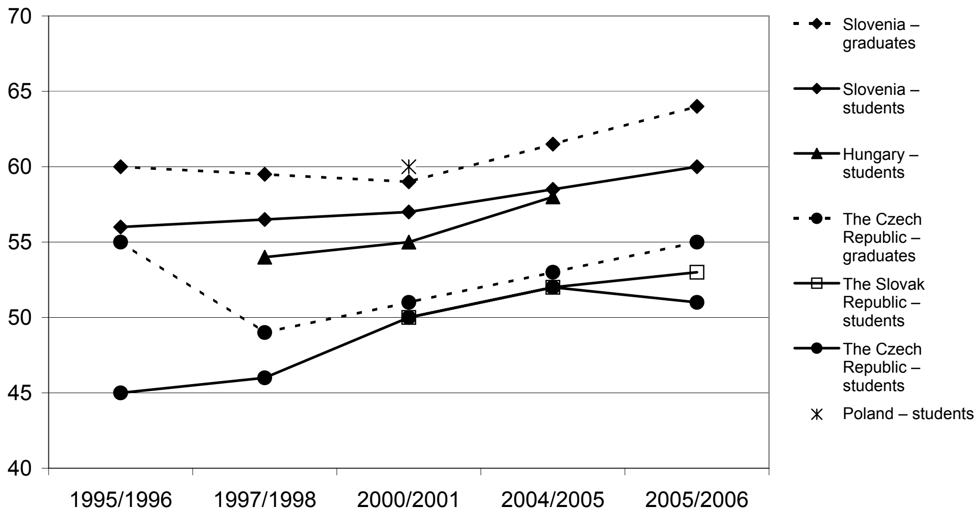
PROPORTION OF WOMEN AMONG UNIVERSITY STUDENTS

After World War II, the number of students and the percentage of women in higher education further increased. The number of female students was affected by the increasing number of universities and colleges. In Slovenia, the proportion of women students increased from 31 % in 1945/46 to 56 % in 1995/96 and 60.1 % in 2005/2006. This trend continued after the fall of communism. In the Czech Republic constituted for 45 % of university students in 1995/1996 and 51.3 % in 2006/2006.

The same trend can be seen in other Enwise countries. For the first time in 1997 women studying at universities in Slovakia outnumbered men, which the authors of the Slovak report consider a breakthrough in terms of student gender structure. In Hungary in the academic year 2004/2005 women accounted for 58 % of undergraduates in higher education (in 1997/1998 it was 54 %), and the proportion of those attending PhD or MA courses also increased significantly: in this case women comprised 44.5 %. In Poland, the boundary of 50 % among higher education students was surpassed in the 1980s. The Polish data from 1980 document the participation of women among all students exceeding 50 % (51.7 %). Since the end of the 1990s, the number of female university students has been growing constantly. In Poland in 1999, women comprised over 60 % of all students. Naturally the number of male students has also grown, but to a lesser extent.

The number of female students taking extramural forms of higher education studies and the number of women graduates has also increased in the Enwise countries since the 1990s. The following graph depicts the abovementioned trend for the Czech Republic, Hungary, Poland, Slovakia and Slovenia.

Proportion of women among university and college students (Slovenia, the Czech Republic, the Slovak Republic, Hungary and Poland)



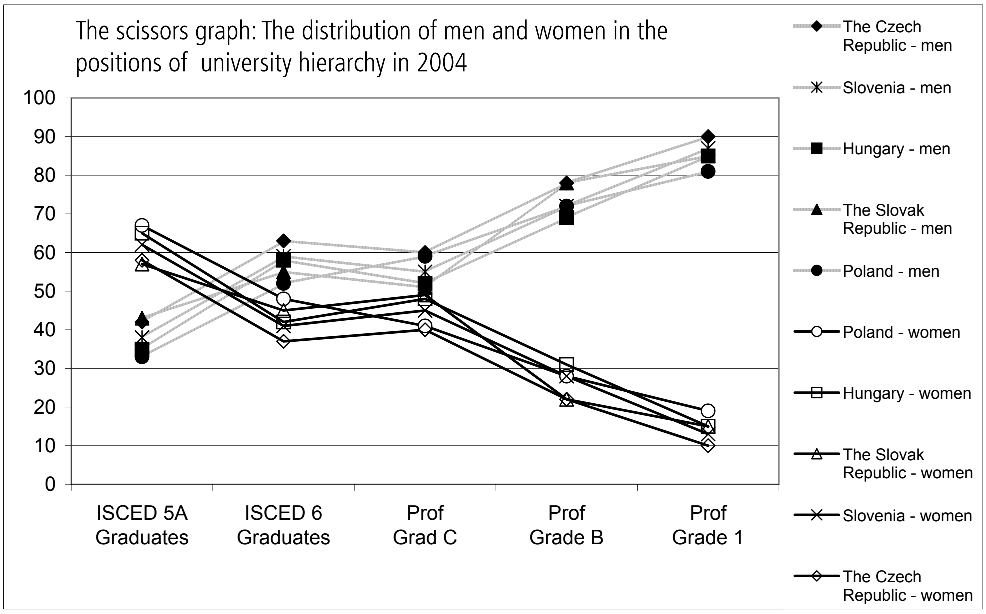
The structure of students by field of study attests to the relatively deeply-rooted horizontal gender segregation. The most feminised studies include pedagogical schools, the social sciences, cultural and humanities sciences and medicine. The popularity of the above majors corresponds to the professions into which women entered earlier; the largest number worked in education and pedagogy, healthcare, social assistance, librarianship and scientific information as well as administration. **Despite the dynamic expansion in the number of full-time female undergraduates the gender gap continues unabated.**

A breakdown by gender and discipline in Slovenia shows that in 2005/2006 women students formed the majority of students in education (80 %), arts and humanities (72 %), the social sciences (68 %) and health care (80 %). Women students comprised only a third of students in science, math and computer science. Changing trends in computer science are worth mentioning: computer science was very popular in Slovenia in the 1980s with women comprising 40 % of the student body. At the time, it was not considered to be as technical as nowadays, but was perceived on a similar level as the natural sciences. In late 1990s and early 2000s with the onset of rapidly changing technology, computer science got a reputation for being of technically demanding. However, other countries have slightly different experiences. In Poland, female enrolment in mathematics and the natural sciences increased while in the state socialist period these fields were dominated by men.

However, the growth in the proportion of women among higher education students is not reflected in the distribution of university positions and scientific degrees.

ACADEMIC CAREERS OF MEN AND WOMEN

While the number of students has steadily increased since the beginning of the 1990s, PhD studies still represent a critical point for women and the realisation of their ambitions. The proportion of women and men is equal among university graduates but their paths begin to diverge after graduation. This shift is well illustrated by the scissors diagram. As the proportion of women decreases at ever step of the academic hierarchy, the proportion of men increases. Despite the fact the over half of university students in the 1990s were women, when it comes to the question of a scientific career, women constitute approximately only a third of university teachers and 10 – 18 % of full professors.



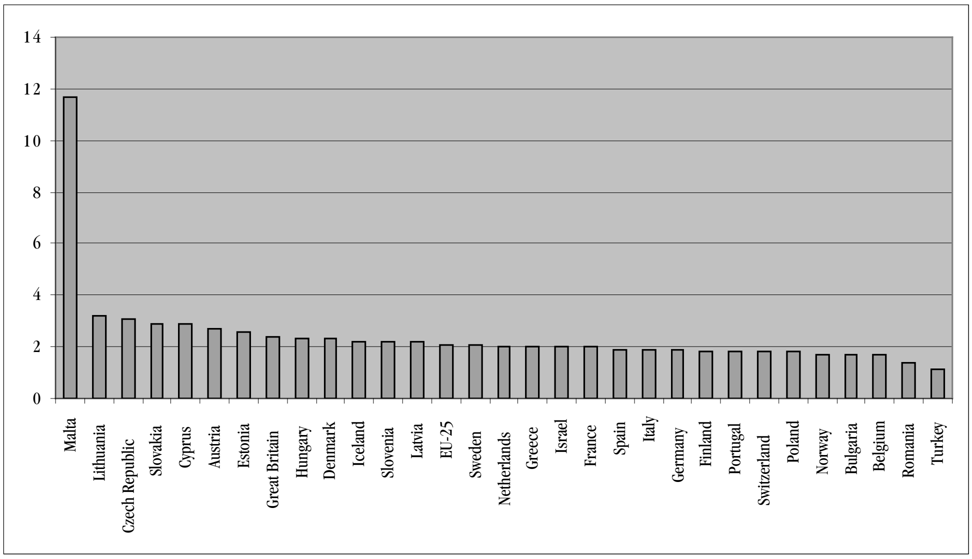
The gender gap in the teaching profession in higher education is well documented by the Hungarian data. In 1990, the proportion of women among academic staff at universities was 33 % and it increased to 37.7 % by 1999 and 38.65 % in 2005. At the same time this growth was not reflected in the distribution of university and college positions and scientific grades: in 1999, women constituted only 13.4 % of professors, 29.5 % of university and college associate professors, 40.9 % of assistant professors and 46.6% of assistant lecturers. Compared to these figures the situation had worsened by 2005 when female employees constituted only 11.94 % of professors, 26.83 % of associate professors, 35.73 % of assistant professors and 43.89 % of assistant lecturers.

Countries train countless male and female talents but women gradually 'fall out' of academia over time. Women are forced to give up their ambitions and do not start their scientific careers at the most productive age if they want to have families, which continue to be viewed at the personal level of private struggles and problems. In order to return to research after being on maternity leave for a year or so, a woman must either have someone to help her with getting back and catching up with the new situation in research, or take the risk of loosing her position, perhaps having to consider some other aspect of scientific work. This is a huge waste of talent since society is deprived of the benefits of the money and energy invested in training these early stage female researchers, not to mention the discriminatory nature of these processes.

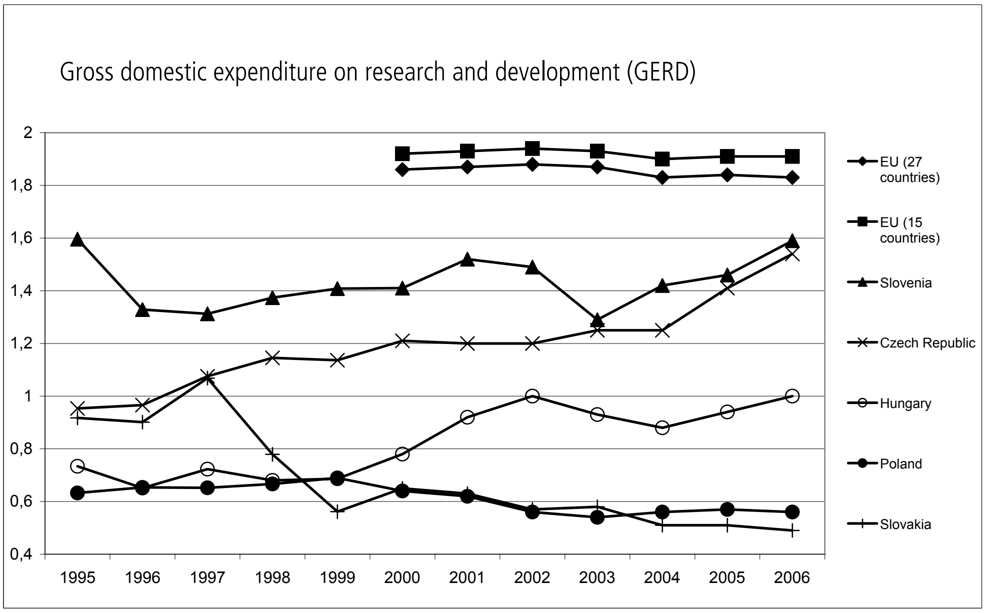
If we compare the situation in all ENWISE countries, the scissors are the closest together in Poland, on the contrary in the Czech Republic they are the most open.

PARTICIPATION OF WOMEN IN SCIENCE

Despite the accessibility of data concerning the percentage of women with professorships and habilitations, it is hard to compare and estimate the barriers to women's academic career paths. For this reason, the *Glass Ceiling Index* has been designed – it is an indicator measuring the relative chances for women compared to men of reaching a top position. It is calculated as a fraction of the proportion of women full professors and proportion of women among doctors, doctors with habilitation and full professors. A Glass Ceiling Index of 1 indicates that there is no difference between women and men regarding promotion. The higher the value the thicker the glass ceiling. The figure shows the glass ceiling's 'thickness' in the EU member states. In a study conducted in 2004, focused on the 25 countries of the Community, as well as those applying for accession at that time (Romania and Bulgaria) plus Iceland, Norway, Switzerland, Israel and Turkey. Poland was in sixth place, Slovenia and Hungary were slightly above the average of EU-25 and the Czech Republic and Slovakia were among four countries where the glass ceiling was the most pronounced (a worse situation was indicated only in the case of Malta and Lithuania).



In terms of the percentage of women in science and expenditures on research and development, we can also see slight differences among the countries under study. The following graph depicts changes in gross expenditures on research and development during last ten years. In all the countries under study the expenditure has been below the average of EU 27 and EU 15.



Source: EUROSTAT

In Slovenia, the country with the highest level of expenditure on research and development, researchers are mostly employed by universities and research institutions. In 2005, 60 % of all employees at universities were women, occupying mainly lower positions with lower education levels. While women make up most of the employees, they only comprise 36 % of all researchers employed in the HE sector. Women form one quarter of employees with a PhD degree but more than 60 % of employees with secondary education or lower. In the business sector, men constitute a majority of researchers (75 %), while in the government sector the percentage of women is relatively high at 43 %. The private and non-profit sectors employ only a small proportion of all researchers.

In the Czech Republic, the second country with relatively high expenditures, in 2005 women comprised 32.6 % of the employees in research and development. The Czech Republic is the only post-communist country where the percentage of women in science is lower than the EU-15 average. Furthermore, more than half of women employees in research and development are engaged in non-research activities. Only 44 % of women working in research and development hold the position of a researcher, compared to 63.7 % of men. Most women in research and development work in medical research (55.8 % of all researchers in this sector) and the social sciences and humanities (47.8 % of all researchers in this sector), fewer women work in the technical sciences. The percentage of women among decision-makers is minimal. There was not a single woman on the board of the Academy of Sciences of the Czech Republic in 2006.

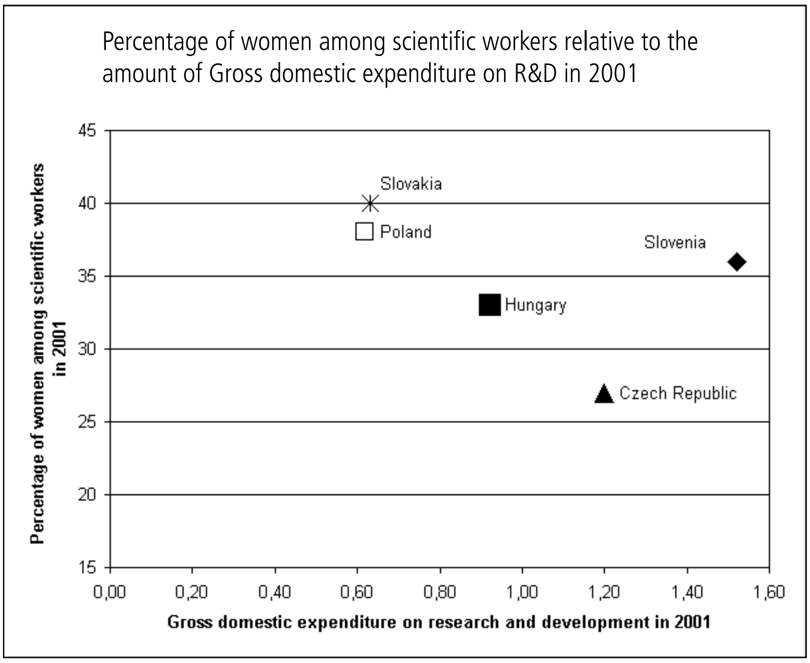
In Hungary, R&D expenditures correspond approximately to the average in Enwise countries. By 2005 the total number of researchers had reached the former level of 30,000, with women constituting 34.2 % of researchers. The proportion of female researchers rose significantly in the early 1990s, and since 1995 it has remained practically the same; however, if we look behind the proportions, remarkable drifts can be discovered in the number of researchers. While in total, and in the higher education sector, the proportion of female researchers is the highest in the field of humanities in budgetary institutions, in the private sector, their proportion is highest in the medical sciences. The feminisation ratio for all researchers is 51.9 %. In the HE sector there are 57.64 women per 100 male researchers, while this number is 61.71 in budgetary institutions and 29.22 in the private sector. There are only two segments that are female-dominated: the medical sciences and humanities – both in budgetary institutions. Comparing per capita expenditures and the proportion of women researchers, it is evident that it is not always true in Hungary that the proportion of women is the highest where the per capita expenditures are the lowest.

In Poland, which together with Slovakia ranks among the countries with the lowest expenditure, the percentage of personnel employed at universities and in research institutions grew steadily between 1998 and 2002. In 2002, almost 10 % of researchers worked in the business sector; 25 % in the government sector and the rest (65 %) worked at universities. The vast majority of female researchers work in the social sciences and humanities (48.8 and 39.5 % respectively), but the higher up the academic hierarchy, the slower the increase in the number of women. However, since the beginning of the 1990s, one may notice a systematic growth in the number of female professors; the figure increased from 22.1 % in 1991 to 27.0 % in 2005. The percentage is highest in the medical sciences (the proportions of professors of both sexes are the most balanced in this field), while in the social sciences and humanities men outnumber women. Women researchers working at higher education institutions with full professorships constituted 10 % of academic staff in 2004, while the percentage of men with the same title was 21 %.

In the Slovak Republic, 22,294 persons were employed in research and development in 2005 with women making up a total of 9,662 persons (43 %), of whom 7,381 (76 %) were university graduates. A majority of men and women scientists and researchers work in the HE sector. While women dominate among support staff, men outnumber women among researchers. Positive development was recorded in 2006 with the percentage of women among new professors at 34.5 %. The number of women among all university students in recent years seems to be higher than the number of male students. The percentage of women's participation among students is increasing in direct correlation with the decreasing attractiveness of science and expenditures on education and research.

Symptomatically, in countries where **the expenditure on research and development *per capita* is the lowest, the percentage of women is relatively high.** From the geographical point of view, the participation of women in science and research is higher in countries with the lowest number of researchers active in this sector where there is simultaneously the lowest R&D per capita investment. A higher percentage of women in science correlates directly to the lower expenditures for research and development. A similar difference is evident among lower paid and higher paid areas of research. When the proportion of male and female students by fields of study is taken into consideration, we can assume that the structure of female professors reflects the structure of male and female study fields. Women are usually successful in areas of science where the investments are low.

Differences in the salaries of men and women are mainly a result of structural factors, both horizontal and vertical segregation equally. Women are concentrated both in the lower paid positions and in the lower paid sectors of science.



CONCLUSIONS

The comparison of the Enwise countries and EU15 shows significant differences. Generally there are more women in science in post-communist countries than in EU15. However, the exploitation model is hidden behind these statistics. In post-communist countries women occupy lower positions in lower paid sectors. To a large degree, they work as technical staff and there is a considerable vertical and horizontal segregation which is more pronounced than in western countries. The percentage of women is lower in the technical sciences which have the highest proportion of investments.

The EU has had a catalysing effect on the issue of women in science in the new member countries, in this case specifically Poland, the Czech Republic, Hungary, Slovakia and Slovenia. It has resulted in the formation of national Steering Groups for women in science in some countries (CZ, SI), a task force (HU) in another. Some countries still do not have any national structure to promote women in science but funding is available for projects on women in science (PO).

Despite the insufficient reaction by national policy makers, the situation is slowly improving. Women outnumber men at undergraduate and graduate levels of higher education, though we can still see large disparities between fields of study. However, the situation in individual countries differs, as the Enwise report already showed. This is related to the level of research and development expenditures. Nevertheless, even in this case the situation in Slovenia and the Czech Republic, for example, differs in that in Slovenian women have better chances of success. In terms of the percentage of women in science, we can also see slight differences among the countries, though the reason for this is not altogether clear (apart from the abovementioned effect of research and development funding levels).

The push by the European Commission for gender equality is absolutely crucial for the improvement of the situation. However, because the support for this issue is not completely clear-cut at the EU level either, some politicians and policy makers at the national level neglect the issue by arguing that the issue is not so 'hot' either even at the EU level.

Funding for projects aimed at women in science is absolutely necessary – either at national level or at international level – since such projects ensure monitoring of the situation, the submission of recommendations for measures aimed at improving the situation, general awareness-raising in the research community and continued policy debate.

Executive Summaries

CZECH REPUBLIC

The issue of gender equality in research and development appeared in countries in the West in the 1970s and was linked to the second wave of feminism. At the centre of attention were not only questions related to the representation of women in science but also the gender dimension of knowledge production. At the European level the issue started attracting attention around 2000. Current activities span the representation of women in leadership positions, work-life balance issues, increasing the percentage of young women and girls in areas of research where they have traditionally been poorly represented, and last but not least, issues related to gender aspects of knowledge production (methodologies, interpretation of results, and impact on society).

In the Czech Republic the issue started being addressed around the same time: the CR has representatives in the Helsinki Group for Women in Science of the European Commission, and participates in European projects and initiatives (e.g. the European Platform for Women Scientists). In 2000 a Steering Committee for Women in Science was set up by the Ministry of Education, Youth and Sports, and in 2001 the National Contact Centre for Women in Science was launched as a grant project of the Institute of Sociology of the Academy of Sciences of the Czech Republic.

The dominant political discourse for promoting the issue of gender equality in science is the issue of human resources and the development of European economies. This discourse pushes aside approaches arguing from the position of equal opportunities and women's rights. This approach has been subject to critique and to examination by foreign organisations of women in science, as well as by the National Contact Centre for Women in Science which promotes the issue of women in science and gender equality in terms of the democratisation of research, equal opportunities and a responsible approach to knowledge production, including engaging civil society in decision-making processes.

The specificities in the position of women in science that are found in post-communist countries in general have their root in the gender culture: public reflection on gender relations, neglected during the state socialist period, has been slow to revive. This is probably because of the lingering conviction that gender equality has already been achieved. Furthermore, there are important institutional specificities related to research and development funding and organisation.

A comparison of the positions of women in science in the new and old EU member states reveals important differences. In the new (post-communist) countries, the percentage of women working in science is significantly higher, but this fact conceals what could be termed 'an exploitative model': women work in the worst funded research areas and sectors, and to a much greater extent as low-level laboratory personnel, and there is a steeper vertical segregation than in the West. At the same time, the percentage of women in technical disciplines, where investment is greatest, is very low.

Compared to other new member countries, the Czech Republic is sited at the extremes with respect to most quantitative indicators. On the positive side, it has the second highest level of expenditure for research and development (R&D) (though still many times lower than the EU average). However, following the logic of indirect proportion, when compared to men, women in science occupy the worst position in terms of their relative access to funds and vertical segregation. The Czech Republic is the only country among the post-communist countries where the total percentage of women working in R&D is lower than the average of the old EU member states.

Women in R&D made up 33.2 % of research staff in 2000, and 32.6 % of research staff in 2005. The percentages differ significantly when examined according to the type of job position. Though women make up approximately one third of the total employed in R&D, more than one half of these women work in positions other than research positions – in 2000 and 2005, only 44.1 % and 44.9 %, respectively, of all women employed in R&D worked in research positions; in the case of men, in 2000, 63.7 % of all men working in R&D held a research position, and in 2005, 61 % of all men working in R&D held a research position.

The percentage of women in leadership and decision-making positions is negligible in both higher education and academic research as well as in decision-making bodies. In 2005 most women held the position of assistant or assistant professor (47 % and 41 %, respectively). Although women make up one third of the total number of research and pedagogical staff, only 20 % of associate professors were women, and only 7 % of the full professors were women. In 2006 there was not a single woman among the leadership of the Academy of Sciences, the Academic Council; women make up 11.8 % of the Academic Assembly and 13.3 % of the Scientific Council of the Academy of Sciences.

Almost one half of all students are female; the percentage has grown, and in the academic year 2001/02, it crossed the 50 percent mark (50.8 %; and in 2005/06 it was 51.3 %). Female university graduates first outnumbered men in the academic year 1995/96, and in 2005/06 more than 55 % of the graduates were women. These numbers, however, are not mirrored in the higher education research sector – among the pedagogical staff at universities, only one third are women and less than one fifth of women hold leadership positions.

The percentage of women in discipline councils or commissions of grant agencies is unevenly distributed. Women hold the most positions, approximately one-third, in medical and social sciences, and the least (0–16 %) in technical sciences and engineering. Of the total number of grants awarded to universities by the Grant Agency of the Academy of Sciences of the CR and the Grant Agency of the Czech Republic (the Czech Research Council) in 2004 and 2005, only 20 % of the primary investigators were women. The situation is slightly better with grants funded by the Higher Education Development Fund; in 2004 and 2005, women received on average 35 % of the grants in natural sciences, 42 % in social sciences and almost 47 % in medical sciences. This corresponds to the generally higher number of female academic staff employed in these disciplines at public universities.

The historical roots of the position of women in science in the Czech Republic dates back to the middle of the 19th century. Access for women to universities came late compared to some countries, especially the US and Switzerland, with women finally being allowed to study at universities at the end of the 19th century, under the Habsburg Monarchy. Czech women's grassroots movement, supported by some prominent male intellectuals and politicians, played a decisive role in opening universities to women.

The democratic legislation of the first Czechoslovak Republic did not restrict women's access to tertiary education or their social engagements; nevertheless, women with university degrees only managed to penetrate a few professions (teaching, some areas of medicine, pharmacy and law), and to a negligible degree the academic sphere. This was due to the gender stereotypes prevalent in society; the discrimination of women during the Great Depression further increased men's chances on the labour market. Women with university degrees, led by female politicians and journalists, and in a few cases by female academicians, advanced their interests through women's organisations. The activities of these organisations were interrupted by the Second World War and the occupation of the Republic.

During the Communist period, governmental policy declared the 'equality of women' and supported their employment, including employment in research and higher education institutions; nevertheless, the 'glass ceiling' was very low, and this was reflected in the absence of women in leadership positions, the pay gap between men and women, and the subordinate position of women in the workplace. Women could not fight against their economic, political and social disadvantages because the civic society organisations that women could rely on were disbanded and gender issues were tabooed and denigrated. Though 'obligatory employment' was instituted, the division of responsibilities and roles in the private sphere did not change.

As a consequence of the severing of the links to the activism of women in science and in the professions during the First Republic, there are no women's activist organisations today such as women's networks or non-profit organisations in science. Activities in support of women in science are carried out by the National Contact Centre for Women in Science (NCCWS). Through the NCCWS, the CR is involved in international activities. Membership in advisory bodies of the European Commission allows the NCCWS to take part in discussions concerning the direction of equal opportunities policies in R&D in Europe.

Over the last two years things have improved in terms of the attitude of institutions toward equal opportunities for researchers. Institutions now pay greater attention to the maternity/parental leave of students and researchers. Although these measures have problems of their own and are still insufficient, their partiality should be seen as a challenge to adopt further measures. We are also seeing progress in areas that have been neglected thus far. Specific support for female researchers has been limited to the symbolic appreciation of work already done. Though this is necessary in order to provide role models and make female researchers and their achievements visible, no less important should be the support of women in their everyday work, career development and entry into decision-making positions. This is necessary not only in terms of taking advantage of women researchers' potential but also in order to move ahead on the path to equal opportunities becoming standard in research.

HUNGARY

Countless professionals, scientists and inventors have emerged from the universities of Hungary during the past one hundred years—many of whom were women. Their situation was not the easiest since they had to fight in order to be even given the opportunity of a university education. They succeeded gradually at all the university faculties—except for the theological and military ones, which were not opened to women until 1946. Since then, revolutionary changes have taken place: the statistics show that since 1955 more women have attended the basic trainings of higher education institutions than men. In the academic year of 2004/2005, their proportion was 59%, while the proportion of those attending PhD or MA courses has also increased significantly: in this case the percentage of women increased to 44.5%. Examining undergraduates according to the ISCED categorisation of fields of study, it can be stated that the proportion of women exceeds the proportion of men in most fields, but there are still some branches of science where the proportion of women is much smaller in higher education, and these are the following: engineering, computing, architecture and construction. On the other hand, it is interesting that 20% of the PhD students in the technical sciences and engineering are women. As regards occupations, we shall find that there are certain intellectual professions in which women's presence is low, while in some other professions it is remarkably high. The tendency for men to avoid low-paid professions still prevails today. Teaching, some fields of medical professions—such as anaesthesiology, radiology—and profession of judge within the legal system belong to these occupations.

Researches have proven that the career development of professional women is much slower than that of men. Women with a vocation for scientific research are in an even harder situation. In 2005, altogether some 31,407 researchers were registered in budgetary institutions, in the private sector and in the institutions of higher education: 34.2% of them were women. The proportion of women among scientists and engineers was the highest in the budgetary institutions; their number in this sector, however, is not much different from their number in the private sector, while their percentage is a little bit lower in higher education, where—in total and also regarding only women—three times as many researchers work. On the other hand, the higher education sector employs women in the largest number and proportion in technician and other positions.

Surprisingly the gap in women's proportion between scientists and engineers and the other positions is the largest in higher education and not in the private sector as one might assume.

Examining the sectors it must be stated that the general trends which apply to most of the members of the European Union, namely that women's proportion is the highest in humanities and the lowest in industrial research, are not completely applicable to Hungary. The first statement applies to universities, but the proportion of women is higher in the medical sciences both in the budgetary institutions and in the private sector. The greatest number of researchers is employed by enterprises in engineering and technology and it is particularly interesting that in this field of science this sector employs by far the most women—their number and proportion are both above the values of the other two sectors.

In 2005, the research centres of the Hungarian private sector spent the largest sum on R&D, nevertheless the proportion of women is the lowest in this sector. But on the basis of the comparison of per capita expenditures and the proportion of women in the different scientific fields it is obvious that the claim that the per capita expenditures are the lowest where the proportion of women is the highest does not apply for all the fields in Hungary.

Women's presence is low in the upper echelons of scientific hierarchy which indicates that research institutions are unable to follow the socio-economic changes which can be seen in the increase of the number of women participating in tertiary education and in doctoral training.

The effect indicated by the so-called 'scissors-diagram' applies for Hungary as well. The country trains countless male and female talents, out of whom women gradually 'fade out' in the course of time. This is a great loss for both the sector and the nation's whole economy, since society is deprived of the benefits of the money and energy invested in the training of this segment of the human resources. The scissors seem to have been closing for the past five years, but it is uncertain whether this tendency shall continue, stop or reverse. It is plausible—considering the example of other branches—that once there is more money and better perspectives in research positions, men will return and a fraction of women shall be crowded out from these fields once again.

POLAND

This report describes the legal and social barriers which women have had to overcome in order to gain access to the world of science. The first chapter presents a general outline of the history of the pioneering Polish suffragettes and first women-scientists, taking into consideration the country's complex political, cultural and economic situation.

The second chapter addresses the situation of women in the period from the aftermath of World War II until 1989, the year marking the fall of Communism in Central and Eastern Europe. The 'emancipation' of women inscribed in the Communist ideology brought about both benefits and threats to women in Poland. Higher education and the chance for a scientific career became widespread, but at the same time the division into 'male' and 'female' studies, research areas and jobs was strengthened, while the more prestigious positions and degrees remained mainly in the hands of men.

Chapter three concentrates on the current situation. The transformation has substantially altered the prospects and ambitions of Polish women and men. The educational level of the whole society has increased and the higher educational system has developed. Simultaneously, however, traditional customs have come to the fore, together with the stereotypical perception of gender and resistance towards feminism, which have been erroneously associated with the Communist regime.

The report ends with prognoses for the future of women scientists in Poland, taking into consideration recommendations made in 2004 by the Enwise Expert Group.

SLOVAK REPUBLIC

Presented report has been elaborated within the specific support action of the 6th Framework Programme with the aim to stimulate public debate on position of women in science in Slovak republic and it is a product of the WS Debate - *Stimulating Policy Debate on Women and Science Issues in Central Europe* project.

The report shows that although the participation of women and men in science in the Slovak Republic is rather balanced, gender differences exist in the concentration among different scientific disciplines and in different scientific fields. Women are less represented in the highly supported fields of research and development and in the leading posts.

Current legislative framework in Slovakia is formally compatible with the EU legislation, which explicitly defines equality between men and women as one of its key values. All EU directives about gender equality were transposed to the legislation of the Slovak Republic and they helped considerably to establish principles of gender equality in the legislation of SR.

National action plan for women adopted in 1997 on the bases of the Beijing declaration represented the main Programme document for the period of the next ten years. In 2001, government accepted the Concept of equality in opportunities for men and women, continuation of the former action plan and acted upon the experience with its implementation. This strategic document was more complex and elaborated and focused on the following domains: labour market, public and political life and family, and work and life balance.

From the beginning of the 90-ties a continuous increase in the numbers of university students has been recorded, and particularly of women students. In 1997, numbers of women students exceeded numbers of men students for the first time. PhD studies, where the numbers of women are not in the favour of them, represent a critical time for women and the realisation of their ambitions, and the start of their career in the academic sphere. Considerable difference at the highest level among men and women professors decreased only insignificantly.

Differences in the salaries of men and women are mainly results of structural factors, equally in horizontal and vertical segregation. Women are concentrated in the poorly paid sectors with low labour prize (services, education, health system,...). Also in the case of women in leading positions and decision-making posts the difference shows to be about 33% on average, compared to men in the same positions. The highest differences between the salaries of men and women are at the highest academic levels.

Slovakia has a relatively good research potential, but as a consequence of weak and non-effective support from the government its quality considerably lags behind the most developed European countries. A Programme for popularisation of science in the society presented as a tool aimed to foster better exchange of information between scientific community and to increase interest of young people in science and research does not contain any comment related to the support of women's participation in science and research, or to overcoming the rooted stereotypes embedded in study preferences.

In spite of the development in the gender issues that has been achieved during the last years in Slovakia, a problem of the non-satisfactory structure of coordination mechanisms on these agenda persists, in addition to inadequate status, necessary institutional background, and the major weakness – no clear vision.

SLOVENIA

BY PROF. MACA JOGAN

At the beginning of the 21st century one of the common characteristics of all European societies and countries is a more or less noticeable gender inequality. In view of the prevailing androcentric cultural orientation we are dealing with discrimination against women, which has been wholly institutionally guarded and strengthened throughout the centuries. The elimination of gender discrimination and the establishment of equal opportunities for women and men for personal growth and versatile activities is a very complicated and lengthy process which is determined by a number of interlinked factors in different areas and at different levels.

DISCRIMINATION AGAINST WOMEN IN SCIENCE – A WORLDWIDE PROBLEM

Hidden (or even outright) gender discrimination is also present in the field of science, which contradicts the UN Human Rights Declaration (1948, article 2) and the EU Charter of Fundamental Rights (2000, article 23). At the same time, we are in particular losing women's intellectual capacities, and that represents a loss for science as well as for society as a whole. This worldwide phenomenon has become a global problem which the United Nations Organisation explored particularly in the United Nations Decade for Women: Equality, Development and Peace (1976–1985). At the end of this decade, the Nairobi Forward-looking Strategies for the Advancement of Women to the year 2000 (1985) were adopted. Article 203 establishes: 'We particularly need to encourage greater integration of women in scientific as well as technological training and education.'

Within the global framework an important role in raising awareness of the need to eliminate different forms of discrimination in the field of science was played by UNESCO and in Europe and the European Union in the last two decades by the Council of Europe, and especially by the corresponding bodies of the European Commission. Thus the European Commission's Directorate for Research (department for Women in Science) has with various activities contributed to the fact that the principle of equal opportunities for women and men in science has become a topic of critical judgment and the basis for finding political guidelines enabling its establishment.

THE EU AND THE POLICY OF EQUAL OPPORTUNITIES FOR WOMEN AND MEN IN SCIENCE

Among the many documents of the European Commission which implement the policy of equal opportunities for men and women in science and which in the long term should contribute to the 'tectonic shifts' in this field, two in particular are very important. The programme for the implementation of gender equality in science is part of the report Women and Science – Mobilisation of Women for the Enrichment of European Research which was adopted by the European Commission on 17 February 1999. On the basis of a wide range of gender specific data on the achieved progress, which were collected by the Helsinki Group for Women and Science (established in November 1999) and the ENWISE Expert Group (established in September 2002), the European Commission on 11 March 2005 adopted the working material Women and Science, Excellence and Innovation – Gender Equality in Science which precisely describes the future priority tasks of the European Commission and the member states. The report which is particularly important for the Central and Eastern European countries (post-socialist countries) is the report of the ENWISE Expert Group entitled Waste of Talents: Turning Private Struggles into a Public Issue (Blagojevič et al, 2004).

In these documents, the tasks are more closely focused on problems regarding horizontal and vertical segregation and encompass the encouragment of interdisciplinary research on gender relationships, the integration of the gender dimension into the measures of scientific excellence, the strengthening of men's role in the implementation of equal gender opportunities in science, increasing women's share of decision-making positions as well as in the fields of technical disciplines and innovations, and the establishment and assurance of favourable organisational circumstances for a successful balancing of work and family obligations. The report of the ENWISE Expert Group among others includes the following recommendation: 'Special attention should be devoted to the realisation of the approach which would implement gender equality in the national educational policy – from primary school to higher education institutions; … universities and scientific institutions should set up a department or appoint a person responsible for the development of activities which would motivate women in science, and which would implement the policy of equal employment opportunities; … the media should improve the image of science … the image should particularly attract women and the younger generation …'

SLOVENIA AND THE IMPLEMENTATION OF GENDER EQUAL OPPORTUNITIES POLICY IN SCIENCE

In order to reach a better comprehension of the present situation, we need to give a brief historical outline. Slovenia is very similar to other European countries. Since the time when women were still excluded from university education until the beginning of discussions on equal opportunities policy in Slovenia, only a century has passed (1897). From the first Slovenian university was established in Ljubljana (1919), the share of women among undergraduate students grew until the beginning of World War II (in the academic year 1938/1939 the share of women was 22.3 %) , and even more so in subsequent years: from 31.2 % in academic year 1945/1946 it increased to 57.2 % in 2000/2001. Among those who finished their BSc degree, the share of women grew even more. Ever since the middle of the 1980s it has been higher than the proportion of enrolled women students and in 2005, for example, it had already reached 61.8 %. In the last three decades, the share of postgraduate women students increased as well: in 2003 the proportion of women among all new MScs was 52.7 % and among all new PhDs 41.4 %. In 2003, 34 % of all researchers were women. However, among the teaching staff the share of women is considerably smaller. In 2004, 12.9 % of full professors, 25.8 % of associate professors and 39.3 % of assistant professors were women.

Additional statistical data show that there exists a vertical functional segregation. Even more evident is the vertical segregation in political decision-making bodies concerning science and research, which can be seen in the structure of the most important bodies at state level. The income gap between women and men, which is a universal worldwide characteristic, is relatively small in Slovenia: according to data for 2003, the gross income including supplements for women in the highest category (full professor, scientific councillor) amounted to 91.9 % in comparison to men. Without supplements it amounted to 95.1 %.

The question of equal opportunities for women and men is, despite the legally assured equal status, very much present also in the field of science, which is evident also from research findings regarding the situation of women scientists in Slovenia. The question of equal opportunities was first publicly raised by the Office of the Slovenian National Commission for UNESCO which also financed the research on the situation of women scientists in Slovenia. This research (Jogan, 1996), which included women assistant professors and women assistants at the University of Ljubljana and at the University of Maribor, as well as previously conducted smaller research studies, carried out by women full professors at the University of Ljubljana (Jogan, 1992), disclosed the following obstacles in academic career advancement: hidden discrimination, lack of support in the work organisation, negative prejudices against women, overburdening with unpleasant ('dirty', particularly administrative) tasks, a Spartan lifestyle of women in science (a condition for them to be able to achieve the same work efficiency), overburdening with family/household obligations, low awareness regarding possible changes for the better.

Acting on the recommendation of the Helsinki Group in May 2001, the Slovenian Ministry of Education, Science and Sport at that time set up the Commission for the Promotion of Women in Science (since 2005 at the Ministry of Higher Education, Science and Technology) which consists of 15 members from different organisations and disciplines. Among the tasks which have been carried out by this commission so far, the following ones are particularly worth mentioning: a) it recommended to the appropriate government bodies that the principle of equal opportunities should be included into programme documents, which set long-term research and development policy and into all normative acts which directly regulate the research and scientific field and activity; with regard to the normative acts, it argued for the elimination of asymmetrical burdening of women and men with existentially urgent family and household obligations; b) it prepared the text for the leaflet How to Achieve Equal Opportunities for Women and Men in Science?; c) it carried out two workshops (for the University of Ljubljana and the University of Primorska together, and separately for the University of Maribor) and later on prepared appropriate recommendations; d) it set up a network of women and men researchers in the field of gender research; e) it regularly studied relevant gender specific statistical data regarding the situation of Slovenian women and men in science and instances of (potential) discrimination and obstacles for the implementation of equal opportunities in a scientific career (e.g. in tenders). The efficiency of this commission, however, is also dependent on the attitude of the wider social environment and particularly on how much support it receives from decision-making political bodies at state level, in scientific and research institutions and in the media.

In order to learn more about the viewpoints of the relevant wider environment, a minor investigative study was conducted within the framework of the Central European Centre for Women and Youth in Science (CEC-WYS) in 2005. This research included the holders of decision-making positions in the field of state authorities (17 persons), public media (19 persons) and science and research (38 persons). From the multitude of findings only a few are presented here.

The holders of decision-making positions in the field of state authorities mostly believe that the present situation is 'more or less all right.' A similar opinion is held by those who have decision-making positions in scientific and research institutions as well as by the public media. On the other hand, however, it was pointed out that 'something is not quite right' and that changes are inevitable, 'a step forward'. This is most obviously indicated by the following conclusions:

- the employees who are responsible for the implementation of equal gender opportunities policy in science and research (co-ordinators) are not properly qualified;
- insufficient co-operation between the competent state authorities (ministries, offices, agencies) regarding the regulation and monitoring of different activities which would ensure equal treatment of women and men in general and particularly in science;
- insufficient transfer of new knowledge (which includes the gender dimension) from scientific and research institutions to government (and other state) bodies;

- no (or very weak) co-operation between non-governmental organisations and the competent state authorities responsible for the improvement of the present state and for (more) efficient implementation of equal opportunities policy.

CONCLUDING THOUGHT

The characteristics of the present situation of women in science, political guidelines of the EU regarding the circumstances created for equal opportunities for women and men in this field and the characteristics of those who are responsible for a co-ordinated implementation of these guidelines in Slovenia, show that changes still need to be carefully planned. However, a positive acceptance of changes is not a generally prevailing attitude and is also not gender independent. On the basis of the present situation one can suppose that women are the ones who are more sensitive to the presence of discrimination and are therefore stronger proponents of changes. They also put forward rather precise suggestions regarding future activities. Among these suggestions, special attention is devoted to the one regarding equal distribution of family obligations between both partners. The adoption of this suggestion, however, is very much dependent on the organisational climate.

In order to bring about a full implementation of equal gender opportunities in science, an important role will have to be played by the existing bodies (the appropriate ministries and other government bodies – e.g. the Commission for the Promotion of Women in Science), as well as by the bodies which should be established in the future (e.g. committees or commissions for equal opportunities at universities). The work of these bodies will also be based on the Resolution on the National Programme for Equal Opportunities for Women and Men, 2005–2013 (2006).

TRANS/FORMATION: GENDER, SCIENCE AND SOCIETY IN THE CZECH REPUBLIC

Marcela Linková

Editorial Introduction

Dear readers,

In recent years the National Contact Centre for Women in Science (NCC-WS) of the Institute of Sociology of the Academy of Sciences has published books for academics and the wider public on the issue of women in Czech science and the gender aspects of knowledge production. NCC-WS attempts to initiate public debate on issues related to equal opportunities in research – be it in terms of the conditions for scientific work (such as work-life balance issues) or in terms of socially responsible practice in the production of scientific knowledge. The NCC-WS places emphasis on the need to attend to gender aspects in research topics and the production of scientific knowledge.

This publication aims to further advance these debates. It is intended for those who contribute to forming Czech education and research policy as well as for those who care about the position of women in science. The report is published under the framework of the project *Stimulating Debate on Women in Science in Central Europe* of Framework Programme 6 of the European Commission, and builds upon the report *Waste of Talents: Turning Private Struggles into Public Issues* (European Commission 2004). In addition to describing the current situation, this publication sets the processes and practices we see today within the historical perspective of the formation of European science and the discourses on the gender relations of men and women.

In the first chapter, Hana Havelková analyses the links between discourses pertaining to the formation of science since the 18th century and how the model of divided gender roles that we know today and which we consider natural is enforced. She explores the specific impact that the state socialist regime and its ideology of equality had on the position and roles of women and men in Czech society. She concludes by looking into the differences between the old and new EU member states, and also the differences among the new EU member states, in terms of the position of women in science. In the second chapter, Soňa Štrbáňová analyses the entry of women into higher education and professions, and maps the situation of the first women researchers in the Czech lands. Based on her personal experience, she looks at the conditions of women in science between 1948 and 1989; thus far, no research study has been conducted in the Czech Republic on the position of women in science in this period. In light of the arguments presented by Hana Havelková, there is definite merit in such a study. Such research could explain why certain measures proposed by the EU may seem inapplicable in the Czech context (because of experience with such measures during the state socialist regime, for example) and why it is so difficult to put the issue of gender equality on the policy agenda (because equality was allegedly achieved in the 1970s). In the third chapter, I offer a look at how the discourse about women in science has been formed in the Czech Republic since 2000 vis-à-vis European activities and policies, the types of negotiations that are necessary in various spheres (political, research, the gender community) and the tools and methods that are used by the National Contact Centre for Women in Science to achieve these goals. In the fourth chapter, Hana Tenglerová analyses the gradual changes in attitude in R&D and higher education institutions in response to measures proposed at the conference *Path through the Labyrinth: Why There Are Still So Few Women in Science,* organised by the National Contact Centre for Women in Science in 2005. The last part of the book contains statistical information. Authors Jana Motyková and Drahomíra Kraťková present the current situation in universities in terms of the percentage of women among students and the pedagogical staff and the allocation of funds for research, while Tereza Stöckelová and I offer an overview of the representation of women in the Academy of Sciences of the CR and an analysis of the honey pot indicator.

The title of the publication, *Trans/formation: gender, science and society,* is worth mentioning. Firstly, the goal of the publication is to inspire a transformation in how we think about the position of women in science and gender issues in general. Secondly, it aims to stimulate deeper discussions about why it is necessary to address the issue of women in science and how to deal with the disconnection between the declared values of scientific research (objectivity, assessment based on individual merit) and the continued manifestations of gender bias. Thirdly, it aims to highlight the problematic nature of the concept of transformation as it is used in (not only Czech) research policy. In these documents the Czech Republic is depicted as a place where it is necessary to introduce changes in order to catch up with Western Europe and global science. Our goal is to show that the transformations happening in Czech science are also happening – in similar, though not always the same, ways – in global science, with respect to the newly negotiated demands placed on accountability, research excellence, communication with non-research actors (non-profit organisations, civic society organisations, the industry) and that they are part of this process. What is at stake is not to 'catch up' with these global developments but to actively contribute to these negotiations and to reflect on the changes which this development demands in terms of the conduct of research institutions, the state administration, and researchers themselves. Fourthly, we aim to highlight the transformative nature of science: science is increasingly influencing human lives. From this perspective it is absolutely crucial that changes in our thinking about who we are, what constitutes our being and in what sort of world we want to live be discussed by a range of actors and that this discussion should not remain ensconced in the research community, whose members use the argument that the research community knows best to justify excluding others from the discussion. Part of the transformation is a growing critical realisation that it is not possible to think about scientific research without thinking through and reflecting on the consequences which scientific research can have on our everyday lives and the life of the planet.

I sincerely hope that this publication will offer new and interesting information, and that it will also serve to stimulate thought about concrete actions and behaviour. Structures of inequality are shaped in everyday interactions and it is important to adopt a critical stance toward such structures. We should all ask how we can contribute to the elimination of sources of inequity – for example, by showing a positive attitude toward work-life balance issues in the workplace, an individualised approach to students and their needs, or by ensuring that women play a greater role in decision-making structures. Not only do women need to be able to participate equally in research, they also need to be able to participate in defining research priorities and how funds are allocated for research and development, and to receive timely information about job openings and tenders for leadership positions.

But much more is at stake. Today we have to engage in serious discussions about the direction of research, about who profits from it and whose interests it defends. With respect to the equality of men and women, it is important that, in addition to representatives of the entrepreneurial and industrial sphere, other actors in civil society (non-profit organisations, civic society organisations and others) are also invited to take part in the decision-making processes. These other actors are responsible for building expert knowledge in various areas of research and may at times emphasise aspects of research other than those emphasised by the state, industry or the research community. Research is not only about the economic interests of business, national governments or the EU; research is also about responsible practice toward female and male citizens, their bodies, their environment, their health and security and civic freedom.

Marcela Linková

Transformation that Never Started: Women in Czech Science

Hana Havelková

THE BASIC QUESTION

In western theories of science and epistemology, a large body of knowledge has been produced on gender aspects of science organisation and scientific knowledge. In the Czech Republic this is relatively new knowledge and has been accepted with a great deal of reluctance; critics refer to our different culture and history, including scientific culture and history. The basic question which must then be asked in a national report is: to what extent are the western research findings that were initiated primarily by feminist critiques of science[1] applicable to Czech science and research, and what is the nature of the differences. In other words, are there any local specificities, and if so, what are they?

The existence of local specificities is not in doubt. However, at the very beginning of my chapter I wish to explicate my position. I claim that in all societies building on a millennium-long tradition of masculine hegemony[2], gender *mechanisms* – leading to the marginalisation, exclusion and underestimation of women, especially in prestigious, interesting or traditionally masculine areas of human activity – are very similar throughout the world. What is undoubtedly different is the *concrete situation of male and female researchers* and *their everyday experience,* and this situation also has its own gender specificities. I hold that it can be firmly established that the specific conditions in the Czech Republic do not provide a foundation from which one could argue that the general mechanisms and phenomena (such as covert and overt gender stereotypes) are weaker or can be relativised; on the contrary, they often entrench them. In addition, here – as well as in the rest of post-communist Europe – we can see some gender-related problems that do not exist in Western Europe, or they play a secondary role there.

In post-communist countries we can observe specific conditions:

- at the level of gender culture (as a consequence of the non-existence of a wider social debate during the communist era);
- at the institutional level (this concerns especially science funding and organisation).

  Both these aspects are complex and require scientific analysis building on the apparatus of social sciences and the humanities. It appears that this is usually underestimated even by female scientists from other areas of research. In this text I will attempt to provide a framework for directions for research in terms of the application of 'general' concepts pertaining to the functioning of gender mechanisms in the Czech context as well as in terms of international comparisons and the identification of local specificities.

GENDER CULTURE SPECIFICITIES

One feature typical of a different gender culture (in all of Eastern Europe) is an under-developed gender sensitivity. This has an impact on the functioning of institutions and individuals and is, paradoxically, related to the conviction that there is a high degree of gender equality. Research, however, shows the opposite – general awareness has not yet been affected by expert findings.

In order to be able to suggest in a more detailed and structured way how the different gender culture is acted out, I will use my own theoretical structure, which makes it possible to study the situation and effects of men and women as objects and actors of the 'gender system[3].' I have abstracted four theoretical presumptions which can be taken as *four levels* or *layers* of each gender issue from the perspective of its *participants*. The theses I will introduce are applicable generally, but here I will apply them specifically to the situation of the two sexes *in science and in Czech society*.

In order to understand how the gender system functions, it is important to realise that the theses presented here always *work together and at the same time,* although at first it may appear that they are mutually contradictory. In reality, they are not in opposition; what is more, this system can function only at their intersection. I wish to point out that each of these presumptions (theses) has already been studied in great detail by western (not only feminist) researchers in an interdisciplinary manner. In the Czech Republic, similar lines of research are still in their infancy; correspondingly, such knowledge is rarely recognised as having the status of expertise.

One more remark: I have chosen this theoretical structure because, among other factors, any feminist analysis is suspected of attacking men. It should be clear from my structure that *both the sexes* partake in the gender culture, but in *a different manner* (and this also applies to science).

Theses:

1. *Male elites* throughout history have imposed a *masculine hegemony* using a wide range of tools. Formerly, the main tool was religion; in modern societies, it is legislation and allegedly scientific theories about natural masculine dominance. The most deceptive, and therefore for our analysis the most relevant, aspect of this dominance is the principle whereby *the objective is identified with the masculine and the neutral*. This identification has permeated all *institutions* created by men, including science and the manner in which given activities are performed. This means that when women enter these institutions, the given rules become *a*

norm and measure by which they are judged without it being clear to what extent such rules are, and can be, universal and to what extent they are merely *masculine*. Feminist critiques of science have amassed very interesting findings problematising this neutrality, from archaeology to medicine; and the issue is also very serious in the social sciences. This issue is termed 'gender in the substance of science,' and according to feminist critiques of science it can be observed in *topics, theories and methodologies* reflecting the universalisation of the masculine experience as well as in basic scientific *doctrines and principles* (cf. Harding 1986).

2. Such an established gender arrangement, however, is *maintained (reproduced)* by both the sexes. Women often do not perceive the injustice of their position; on the contrary, they try to show their *cultural aloofness* by diligently fulfilling the role historically attributed to them (Simone de Beauvoir's idea from 1949). Today we can see this mechanism, for example, in how women in higher positions specifically care about their 'femininity[4].' The special attention they pay to their femininity is nothing but an attempt to provide attenuating circumstances when women push to enter areas where they do not wholly 'belong.' In the sphere of science, doing one's gender undoubtedly significantly differs from women's strategies in politics, for example; the situation is also different in top managerial positions. In the sphere of science we are seeing specific and variegated strategies depending on the environment and relationships. The gender aspect can be very complexly structured if only because gender enters the process of knowledge production. It would definitely be a mistake, though, to believe that gender, femininity and masculinity, of oneself and others, can be fully eliminated.

The Czech specificity related to the phenomenon of women obeying the gender order is the naïve idea that the refusal of to acknowledge that women are at a disadvantage is our specificity, that it even proves our greater maturity. On the contrary, it perfectly confirms findings of gender research[5].

3. All men (even those in the lowest positions) *profit* from the gender system (based on masculine hegemony), especially *symbolically* (greater confidence and prestige), *status-wise, economically* and *politically*, and all women, including women's elites, are *disadvantaged* in it.[6] Male elites often play a special role in maintaining a sexist culture. Furthermore, a sense of being elect, enforced by the *history of masculine achievements,* the phenomenon of *masculine solidarity,* and – as confirmed repeatedly in masculine studies – the more or less *mechanical orientation of men on men in public life* all play a role. In other words: the masculine foundation of institutions (see thesis 1) has a direct impact here on the everyday situation of men. In this context, using the terms 'commonplaceness' and 'un-commonplaceness' when describing the presence of one or the other sex in some area, including science, is very useful. The standard sociological terminology includes the 'glass ceiling' and 'glass lift'. Let us illustrate this type of mechanism with an actual Czech case: a very talented young female researcher was defending her scientific work and everyone in attendance recognised the work as being excellent. At the end, however, one of her elderly male colleagues asked: 'Colleague, what about life'? This question *reminds her unexpectedly and inappropriately of her sex* because if the researcher had been a man, no one would have considered asking such a question.

However, it would be a mistake to think that the mechanisms of disadvantage are played out solely in the public sphere. Women are 'of course' linked to the family, and often, hand in hand with this, comes the presupposition that women are dominant in the family. The issue of dominance in the family is more complex. Until recently, men were the heads of families according to the law and literally dominated the family; there is sufficient proof that the high level of domestic violence that continues to go unpunished is a legacy of the traditional protection of the rights of the head of a family. *Men's privileges in the domestic space* must be seen, last but not least, in their *right to leisure time and play* – this is significant from the perspective of the possibilities of a *research career* because the space for non-committal 'play' of any sort is thematised in expert literature as an important factor in *recovering creative powers.* On the other hand, female researchers have not been acquitted of the traditional, unwritten duties women have not freely chosen, the stereotypical connection of 'woman and family' (note the absence of the symmetrical notion of 'man and family'), woman and childcare, house cleaning etc. And what is more important: if a woman cannot or does not want to perform these functions, it is *her responsibility* to justify that decision (although equally her environment could be asked to justify why it expects such things from her). The man's privilege here lies in his *matter-of-fact liberation* from the entire complex of the household. It is quite obvious that this seemingly 'minor' injustice is *absolutely fatal for a research career* because science demands greater engagement than types of occupations.

However, there is a deeper, psychological aspect to this problem: relinquishing care duties to women results in men and women having a completely different *organisation of time*. When nurturing someone, women operate on *cyclical* time. They adapt their entire day to the daily cycle and the needs of those whom they nurture, whereas among men *linear time* dominates, as they are rarely forced to abandon their goal and everything is set in such a way that they can pursue it directly without interruption. Moreover, there have been cases where a successful woman has had to deal with the psychological problems of a less successful man because tradition dictated that he should hold a dominant position in the family. In this case, the woman often *hides or denigrates her success* and 'redeems' her 'sin of success' by assuming the traditional 'duties' of a wife. There are innumerable *Czech examples*.[7] The impact of the traditional order on the situation of women researchers is further exacerbated by *a structural* factor which also follows from this order, which is that nearly one hundred per cent of women researchers live in *two-career marriages* because according to the dictates of culture they are *de facto* forced to marry at least a man of equal intellectual standing. This dictate does not apply to men, and many men researchers live with a partner with a lower educational level or without career ambitions, who provide support.

4. These 'more powerful' (men) also have to *pay for their social superiority,* but in totally different ways, especially in *mental and emotional* areas. They often suffer from the *terror of success* (the duty to be incessantly successful, 'good', strong etc.), emotional dependence and disorientation, the necessity to simulate strength etc.[8], while the ones who are *socially weaker* (historically this has been women) *are not exposed to such pressures* and in a way are internally more free; they often get 'more out of life.' In contemporary societies the notion has arisen that women have the option of occuping a much more varied *scale of life roles,* while men, under pressure from public competition and also the unwritten command not to be a sissy or effeminate, cannot become acquainted to such a degree with what has been traditionally considered 'women's' activities and life experiences, experiences which could enrich them.

How is this related to women in science? Primarily, at issue is the *degree and type of ambitions* of the two sexes. Neither women nor society *expect* the greatest achievements from a woman; being lower on a career ladder is not seen as a personal failure. However, this often leads women to *reduced career motivation* and even laxity; they are exposed to a greater incentive to give priority to 'life' (in the society of children). It is also worth noting that according to anthropologists' findings, women often have less respect for various social hierarchies, they do not identify themselves with them as much, and even, to some degree, have a subversive attitude to social institutions as such. Psychology has also described the *fear of success* among women, the unwillingness to adopt the *culture of competition* etc., while men have a problem evading it.

The opinion that women suffer less from the terror of success than men, and that women receive ample compensation in the sphere of the family, and in the emotional and relational spheres in general, for the restrictions placed on their careers, significantly contributes to the conviction that the arrangement of the gender order is functional and balanced and that both the sexes profit from it, each in its own way. It is precisely this aspect of the gender order which is most misleading, and in my opinion it is the main source of the belief that it is women themselves who are to blame for their lesser degree of success in science. I have attempted to argue that allegedly personal and free decisions are largely influenced by unwritten pressures, the expectations of the environment and the shared culture, that allegedly individual choice always also has cultural and social aspects, that it is usually an individual's *strategy* in a given situation (i.e. a situation that s/he her/himself did not freely create). This strategy is based on a cognitive development, *gender socialisation* from early childhood in such a way that girls and later women are directed toward certain 'choices.' Therefore, various programmes have been introduced in the West that simply provide young *talented girls with another model which actively enforces notions about the appropriateness of women for science and science for women* (shortcomings can be found especially in the technical sciences and engineering and IT disciplines). The Czech specificity is the complete *misunderstanding* of the meaning and necessity of having an active policy of this type. Another cultural factor related to this and one that can be actively influenced is the *image of the scientist* in textbooks, the media etc.: an older man with glasses as opposed to a young woman.

To sum up: the tendency to perceive and see inequalities merely at the legislative level in the Czech Republic still exists; this is a serious problem and a cultural and thus also systemic deficit.

INSTITUTIONAL SPECIFICITIES

The fact that the percentage of women and men in science *is not a consequence* only of a free and natural choice is also attested to by *numbers*: firstly, the striking *differences* in the percentage of the two sexes according to individual *countries and scientific disciplines (sectors etc.)* and, secondly, the statistically provable influence of other *factors*. Until recently, such a comparison was impossible because the relevant statistical information was not available. This has changed with the establishment of the *Helsinki Group* and the publication of two reports issued by the European Commission (*Etan* and *Enwise*[9]), all co-ordinated by the Science and Society – Women in Science Unit of the European Commission. The numbers are surprising in many respects, and it is necessary to know the institutional context in order to interpret them – especially the elementary structure of the organisation of science, research and higher education in a given country.

Transformation of the communist model of science

The transformation in science and research after 1989 was first understood as a move to approximate western standards and to recover the Czech pre-communist tradition. The Czech Academy of Sciences was established in 1890, and by 1937 there were 40 research institutes in addition to universities. At the same time, very close links were established between basic, applied (industrial) and university research. After the communist coup d'etat, a centralist model was put in place which resulted in these links being disrupted and the atomisation of the scientific scene. The basic features of this model were:

- *Expansion of the scientific base*: while in 1951 there were around 14,000 people working in science and research, in 1970 there were as many as 147,000, and in 1988 the number had reached 198,000. It is estimated that only 60 % of these people were directly involved in research activities. The operation of this research conglomerate was funded with an unbelievable 4 % GDP.
- *Autarky* was one of the reasons for the generous funding. The economy was closed to the external world and thus became dependent on national research.
- *Ideological climate*: science was directly subordinated to political structures.
- *Separation of science, education and production*. Since 1952 basic research had been concentrated in the Academy of Sciences. This resulted in a significant restriction on university research and thus, gradually, a drop in the quality of education. Industrial research also declined as there was no great motivation to innovate.
- *Central management*. The state plan contained three basic components: basic research, technological development and economic research.
- *Thematic structuring* was becoming ever more rigid as a consequence of the isolationism. Moreover, the link in humanities and social sciences with the need to examine local cultural developments has been severed.
- Despite the considerable research potential, the whole system was in the end deformed and did not bring many innovations (characteristics according to Provazník et al. 1994).

The transformation of this system after 1989 was considered as marking the abolition of the centralist institutional framework based on pushing science and the (re)introduction of an 'interactively innovative system' (Müller 2001: 186). This change also entailed a new distribution of research and development capacities between academic and industrial research and their individual segments. It is to be expected that it would also affect gender dynamics: as a consequence of horizontal segregation, women worked (and still predominantly work) in the academic sector, and thus the question arises whether the women themselves and the system are sufficiently ready for their entry into the 'interactively innovative system.' Moreover, comparative gender analysis must take care to account for the significant differences among post-communist countries: historically, the Czech situation was typical of a country with relatively strong and developed industrial research, while academic research was carried out in universities. After the fall of communism, in 1990, 16 % of R&D staff worked in academic research and 65 % of R&D staff worked in industrial research (the remainder worked in research controlled by state departments). By 1999, this ratio had changed: academic research accounted for 43.6 % of R&D staff, industrial research accounted for 50.9 %, and governmental research for 5.5 % (Müller 2001: 188). This data is very important for gender comparisons with other post-communist countries; although the ratio of sectors changed, the predominance of industrial research in the past undoubtedly continues to affect the recruitment of researchers by sex.

The special nature of the 'gender contract' under the communist regime

The policy of the communist governments with respect to the position of the two sexes must also be analysed as part of the institutional framework. In the Czech Republic, equality policy was contradictory. The ban on the freedom of association and freedom of speech put an end to an exceptionally wide-ranging and active scene of women's activism, and silenced the voice of women in general. At the same time, the regime set out to achieve equality of the sexes as one of its basic political goals and undertook a number of systemic steps in this respect. It must be stated that compared to other post-communist countries, the regime here had an easier task because thanks to the already existing activism and as a consequence of the less conservative and less religious culture here the regime did not encounter too much resistance. It is interesting that this advantage did not really have any greater effect. Progress was recorded in access to education and to the labour market, but very little in access to economic and political power, and minimal progress with respect to the division of housework (Wolchik 1981: 123–124).

Paradoxically, the situation described above was seen as the natural choice for women in the specific political situation, which was further deformed by making career advancement contingent upon membership in the Communist Party of Czechoslovakia; career advancement in science usually depended on party membership starting with the scientific degree CSc or higher (equivalent of PhD). Because of the political regime, the advantages which scientific work provides today such as international co-operation, travel etc. were out of reach. Under these circumstances, many women gave priority to achieving work-life balance and gave up any thought of building a career, but it can hardly be considered to be a free choice in the proper sense of the word; rather, it was a forced strategy.

After the fall of the communist regime, this very specific *career model* continued to hold sway, but gradually it started to change with the coming of the new generation. Women of the new generations employ different life strategies (visible, for example, in changes in reproductive behaviour). At the same time, however, the power of the inherited *cultural patterns* should not be underestimated, because such cultural patterns are *long durée* (occurring so to speak in the undercurrent of social development and changing relatively slowly). Such patterns include the division of labour in the home (cf. Křížková 1999), childcare etc., and the general traditional emphasis on the family, which was paradoxically strengthened under communism (Havelková 2006). Contemporary research studies show that the model of a career-oriented woman who does not intend to give up having children or creative work, and that often presents the lowering of her high aspirations for her career as a 'free choice', is still fairly common in the Czech Republic. This pattern is double edged. On the one hand it is positive: cultural traditions do not force women to make cruel personal 'choices' between a family and career as is the case in some western countries. On the other hand, it represents gender blindness in the sense that the systemic nature of the issue of building a woman's career and the possibility of introducing systemic measures (such as those that have been introduced in Scandinavia) is not sufficiently recognised. It comes as no surprise that we can find the highest fertility rates in the Nordic countries, where the equality of the sexes both in the public and domestic sphere has been addressed at the system level.

The fact that the official *propaganda* clearly bore fruit must also be considered to be a legacy of communism. How else to explain for example that, despite the fact that we know how formal these measures often were, such a great portion of the public and so many politicians believe that 'a lot has been done for women'? (people, for example, remember quotas in the communist parliament)? Nevertheless, the idea prevails that today no active policies are necessary. In fact, it is striking how little the position of women has changed, especially in politics. Not many people know that after the elimination of the quota system the percentage of women in Parliament following the 1992 elections fell to the level of 1946: 8.6 %! As for various forms of support during motherhood, childcare, illness etc., the rhetoric that was thoughtlessly adopted was that these are 'advantages for women.' In fact, this was assistance to families – i.e. men and children. Moreover, this system attributed women automatic responsibility for family problems and reduced their value on the labour market.

EAST – WEST COMPARISON[10]

An important source of comparisons is the European Commission's report prepared between 2002 and 2004 by an expert group of researchers from Eastern Europe (so called Enwise Expert Group) and published as *Waste of Talents: Turning Private Struggles into a Public Issue*. Although this is just the beginning of analyses, it provides some very interesting conclusions for comparisons of the situation between the EU 15 (old member states) and the Enwise 10 (the new member states) and at the same time makes it possible to compare the post-communist countries to each other (see below).

Statistical data[11] on the percentage of women in science surprisingly speak favourably of the new countries (Enwise 10) where women on average make up 38 % of the R&D staff, compared to 27 % in the old countries (EU 15). The assessment of Framework Programme 5 yielded a similar result: 34 % compared to 22 %. However, the issue of women in science in the new countries takes on *a new dimension,* which is *money*. Upon closer examination of the data, we see a chilling *direct proportionality* between the number of women in individual countries and individual sectors and disciplines, and R&D funding: the worse the funding, the more women there were. The highest percentage of women in science – over 50 % – can be found in countries where the average monthly income in research is around EUR 200 (Bulgaria and Romania, which were also included in the analyses).

Another unpleasant finding is the much greater degree of *vertical segregation* in the new countries (women in top positions). On average women make up 54 % of staff at universities in Central and Eastern Europe, but men are three times as likely to achieve the position of associate or full professor. The Czech Republic had one of the worst scores in this area – men here are as much as six times as likely to reach those positions as women (see Blagojevič M. et al. *Wasted talents*, graph 3.7., p. 89).

Based on analyses of quantitative data we can formulate the following hypotheses about the specificities of the issue of women in science in post-communist countries:

- Women represent a *secondary human resource* – all the more so, the stronger the abovementioned direct proportion and vertical segregation.
- This is related to the fact that in addition to the *waste of female talents* we can observe in Eastern Europe the issue of *wasting male talents*. The typical problem of under-utilising women's potential due to *cultural barriers* is accompanied here by the problem of talented men leaving science for *financial reasons*.
- Women *keep alive* non-lucrative and unattractive spheres of science.
- The analysis of numbers shows that the western problem of women researchers follows from *hard competition* where each gendered cultural factor (see above) plays a role, while the eastern model (and

problem) is largely related to the *use* (if not exploitation) of women. In order to distinguish between these two I use the terms 'competitive' and 'exploitative' model.

The Czech Republic as a statistically specific case: East – East comparison

Generally it was discovered that in the Enwise[12] countries the percentage of women is higher in countries with the smallest research populations and the lowest expenditures per capita – in addition to Bulgaria and Romania mentioned above, this also applies to the Baltic States. *The Czech Republic has the second highest R&D expenditures (after Slovenia)* and the second highest percentage of *industrial research* (after Slovenia). But it also has the lowest percentage of women in research: at 26.8%, it is the only Enwise country that is below the EU 15 average.

In the Czech Republic, in addition to the above percentage, there are other statistics that confirm the thesis that the better the state of science, the worse the situation for women researchers (all statistical findings are based on a mutual comparison of post-communist countries):

- absolutely *lowest* access of women to funds[13];
- by far the lowest percentage of female researchers at 26.8 % (see Blagojevič, M. et al. *Waste of Talents*, Table 3.2, p. 73), meaning that women here work more often only as technical staff;
- after Poland we have the greatest percentage of completed PhDs but absolutely the *lowest* number of women among them: 34.7 %. When broken down according to sex, the ratio of higher education graduates completing their PhD is similar: we have the *highest likelihood* that men will complete their PhD (twice as high as women in 2001, in 2000 men were even three times as likely to complete their PhD) (see Blagojevič, M. et al. *Waste of Talents*, Table 3.4, p. 77);
- the gender pay gap in the Czech Republic is the *highest* at the level of people who completed their university education: women receive only 68.4 % of men's salaries (according to Czech Statistics Data 2006) ;
- in terms of EU policy, the goal of which is to achieve at least 40 % representation of women at all levels in the implementation and management of research programmes, the Czech Republic again fares the worst according to the relevant indicators (see Blagojevič, M. et al. *Waste of Talents*, Table 4.3, p. 106 and graph 4.3, p. 108).

CONCLUSIONS

In the comparison of post-communist countries, the Czech Republic finds itself at the extremes in terms of most indicators – in terms of funding and research structure, the Czech Republic (following Slovenia) relatively best approximates the situation in the EU 15 (nevertheless, R&D expenditures per year per researcher were 6.5 times higher in the EU 15 than in the CR in 2001!), but the situation of women researchers here is the worst. In other words: the better the economic situation of the country, the more adverse the gender culture – although the average number of women researchers in the EU 15 is approximately the same as here, the equality indicators are much better in the EU 15 (lower vertical segregation).

I believe that thesis can be formulated that as far as the position of women in science is concerned, we are dealing with a *combination of a competitive and exploitative model* in the Czech Republic. Why competitive: research funding is no longer so low as to put men off; men are concentrated in sectors and disciplines where the funding is the highest. Thus, the environment is competitive and in addition to the undoubtedly important *structural factor* of having traditionally strong (and traditionally masculine) industrial research, the adverse gender culture is probably also to blame for the low percentage of women in research. Why exploitative: horizontal and vertical segregation results in women being concentrated in the financially under-valued, though indispensable, position of technical staff in research or pedagogical staff in HE institutions.

The position and involvement of women in science is a complex matter which must be studied at the intersection of many disciplines using verified methods which are able to identify covert mechanisms in which gender patterns influence behaviour, the operation of institutions etc. Although comparing gender cultures in individual countries is difficult, it is possible to compare the degree to which gender issues are considered in society and in science – the research organisation is part of a given culture and thus it cannot avoid gender issues. The degree of gender awareness in the Czech Republic is still very low. Statistics can be one impulse for increasing the awareness of gender issues in the Czech Republic because statistics at least challenge the general conviction that equality of the sexes in Czech science is at a satisfactory level is largely an illusion. We should start asking the question why a great majority of the indicators attest to Czech women having the worst position in science compared to women in science both in Western European and Eastern European countries. It is necessary to carry out complex qualitative research if we are to identify gender asymmetrical practices and concrete factors and mechanisms, which are the cause of the aforementioned, undoubtedly unflattering, image of the position of women in Czech science.

BIBLIOGRAPHY

Blagojevič, M., Bundule, M., Burkhardt, A., Calloni, M., Ergma, E., Glover, J., Groó, D., Havelková, H., Mladenic, D., Oleksy, E. H., Sretenova, N., Tripsa, M. F., Velichová, D., Zvinkliene, A. 2003. *Waste of talents. Turning Private Struggles into a Public Issue. Women and Science in the ENWISE countries.* Luxembourg: European Commission.

Harding, S. 1986. *The Science Question in Feminism*. Ithaca and London: Cornell University Press.

Havelková, H. 1999. "The Political Representation of Woman in Mass Media Discourse in the Czech Republic 1990–1998". *Czech Sociological Review*, Vol. 7, No. 2, pp. 145–165.

Havelková, H. 2006. "Jako v loterii: politická reprezentace žen v politice po roce 1989". Pp. in: Hašková, H., Křížková, A., Linková, M. (eds.). *Mnohohlasem: vyjednávání ženských prostorů po roce 1989*. Praha: Sociologický ústav AV ČR.

Křížková, A. 1999. "The Division of Labour in Czech Households in the 1990s". *Czech Sociological Review*, Vol. 7, No. 2, pp. 205–214.

Müller, K. 2001. "The Czech Republic – Science, Technology and Education". Pp. in: Gorzelak, G., Ehrlich, E., Faltan, L., Illner, M. (eds.). *Central Europe in Transition: Towards EU Membership*. Warsaw: 'Scholar' Publishing House.

Osborn, M. et al. 2000. *Science policies in the European Union: Promoting excellence through mainstreaming gender equality.* A report from the ETAN Expert Working Group on Women and Science. Luxembourg: European Commission.

Provazník, S., Filáček, A., Křížová-Frýdová, E., Loudín, J., Machleidt, P. 1994. "Transformace vědy a výzkumu v ČR". *Teorie vědy Theory of Science,* Vol. III (XVI), No. 3–4, pp. 5–152.

Vymětalová, S. 2001. "Domácí násilí: přirozený jev?" *Sociologický časopis*, No. 1, pp. 103–121.

Wolchik, S. L. 1981. "Elite Strategy Toward Women in Czechoslovakia: Liberation or Mobilization?" *Studies in Comparative Communism*, Vol. 14, No. 2–3, pp. 123–142.

Endnotes

1 The several decades of feminist debates also include internal critiques of the universalism of feminist concepts. This means that today international feminist discourse is very perceptive to local specificities and their identification by local actors and experts. The question we ask here then cannot be understood as some defensive or conservative position but as a regular aspect of international feminist debates.

2 In the feminist discourse this tradition of social arrangement is usually denoted by the term 'patriarchy.' In view of the fact that the term patriarchy is essentially a dual term, which primarily denotes the rule of 'fathers' over other men and within this system the rule of men over women, some feminist theoreticians prefer the term 'masculine hegemony.' Sociologist Pierre Bourdieu works directly with the term 'masculine dominance' or 'domination.'

3 This term has other alternatives, the most common being the 'sex-gender system' or the 'sexual system.'

4 My research into the media discourse on women in politics has revealed that the higher a woman is aiming, the more femininity (women's image) matters: at the level of female mayors you don't find any assurances such as those given by female politicians that they still cook and clean for their husband, which is common among female Members of Parliament and Senators. Moreover, in their case, apart from abilities, comeliness is still demanded or at least monitored, while in the case of mayors even vigour is interpreted as a female characteristic (Havelková 1999).

5 The first sociological study on domestic violence in the Czech Republic revealed a surprisingly high percentage of women who 'have an understanding' for the fact that their male partner beats them (Simona Vymětalová, Sociologický časopis 3/2001). Can this be considered to be a proof of gender maturity?

6 It should not confuse us that these are women who themselves belong to the elites. Although in society as a whole they have a higher position status-wise than an absolute majority of men, the same entrenched cultural doubts about whether 'they are good enough' still affect them. On the contrary, women themselves are often so satisfied with mere participation in a given elite (in the case of science, with the fact that they are doing a highly creative work) that they often facilitate their own discrimination in the given status quo. They must specifically justify their right to be part of a professional elite, which in and of itself is a disadvantage. And let us not forget one crucial aspect related to moral philosophy: each sexist statement, each discriminatory act based on sex always concerns all women because it maintains the mark of sex as grounds for differential treatment in that culture.

7 To give an example, I will mention an article published some time ago in *Reflex*, titled 'Smart women are silent about their schools.' The title was meant absolutely seriously; a female expert advises women to treat their higher qualifications as a 'physical handicap' (they should hide it as much as possible).

8 All these findings have been repeatedly confirmed by results of qualitative research studies carried out in men's studies.

9 Both the reports were co-ordinated – but not created – by the Women in Science Unit, which under Framework Programme 6 was part of Directorate L of the Directorate for Science and Technologies of the European Commission. The Enwise appellation was created by an expert group of women from the post-communist countries and it is the acronym for Enlarge Women in Science to the East. At the same time it is a play on the base 'wise' – to make (European science) wiser.

10 East and West represent here geopolitical and symbolic entities, not geographic, and therefore they are capitalised.

11 The following data comes from tables and diagrams contained in *Waste of Talents 2*003.

12 The Enwise countries are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

13 This conclusion was reached by the Enwise Expert Group using the honeypot indicator – see the chapter The Bees and the Honey, pp. 66–95, especially graph 3.5 in M. Blagojevič et al. *Waste of Talents* 2003.

Women in Science between 1840 and 1989

Soňa Štrbáňová

CREATING THE CONDITIONS FOR WOMEN'S ENTRY INTO SCIENCE BEFORE 1938

Beginnings

'A woman's ignorance is a whip which entraps a man: as long as the woman is not aware of her high position and mission in society which God assigned her, the man builds on a loose base. The woman must be a man's helpmate if the task is to come off.'
Božena Němcová 1856

The history of Czech women in higher education (see Bahenská 2005; Štrbáňová 2004; Štrbáňová, Stamhuis and Mojsejová 2004; and other literature cited in these works) helps us to understand why it was so rare to see a Czech woman at the bench in an observatory or at the teacher's desk in a university auditorium during the first half of the 20th century and why an imbalance in men's and women's participation in science has survived until today.

In the 19th century, the educational programme of the National Revival did not take women into account and their education was considered only to the extent that educating them was necessary for the needs of the patriotic Czech family: the ideal woman and wife was a patriot, sufficiently educated to be able to raise her children (primarily sons) in a reliable and patriotic way, to bring respect to the family and to help her husband in business if possible. The rare private and public female educational institutions corresponded perfectly to the plans and level of quality based on these ideas.

In 1842 the utopian visionary Karel Slavoj Amerling established the *Budeč School* in Prague. The school was a 'cathedral of science' for all social classes, including women, especially in scientific fields. Thanks to Amerling's intervention women could even sit in on lectures at the Medical Faculty in 1844, but only as passive auditors and for one semester only. The generous Budeč project, which was funded by patrons and could boast modern laboratories, a library, collections, as well as a photographic studio, came to an end in 1848.

Women were involved in lively social activities of the social salons in the 1840s – not only as hostesses but also as participants in debates about literature, philosophy and science. In the circle around doctor Václav Staněk, the physiologist J. E. Purkyně, the businessman Rott, politician Brauner, politicians and natural scientists in the Frič family, and many others, there was a growing number of women who were becoming increasingly upset by the traditional female role. Their role model was Božena Němcová, whose life became the symbol of the transgression of social conventions and of the endeavour to lead a self-confident social and professional life. Exchanges with her intellectual friends, such as the anatomist Dušan Lambl, the archaeologist Krolmus, the philosopher and priest Klácel, the physiologist Purkyně and many others whose influence can be found in Němcová's work, compensated for her lack of schooling. For her studies about the relations between the countryside and nature, and her collections of folk songs and fairy tales, we should consider Němcová as the Czech first female scientist – a pioneer of ethnography and geo-botany. She has survived in the public mind as the creator of a kind and caring female ideal – the Grandmother; however, women of her generation looked to her mostly for her independence, nonconformity, liberalism, desire for education and her efforts to succeed in an exclusively male sphere. Though these characteristics provoked animosity, they also made people want to follow in her footsteps. She became a role model for women around whom a women's movement crystallised, especially the Rott sisters – Sophie and Karolína.

First important educational institutions for Czech women

In the 1850s and 1860s the Czech National Revival entered a new phase dominated by the establishment of Czech education at all school grades; the fall of the Bach Absolutism provoked a massive wave of club activities at the beginning of the 1860s. The youth and gymnastics organisation Sokol, the singing society Hlahol and the Patriotic Society of Artists were founded and Czech scientists and technicians started to gather in expert associations. This commotion reached beyond the walls of the house of the wealthy businessman Rott, in Malé náměstí in Prague. He had two daughters who would become writers. The older, Sophia, married the doctor J. Podlipský in 1858, one of the founders of the Czech Doctors' Association (1862), and she helped him with the administration of this scientific association. The younger daughter, Karolína (who adopted the pseudonym Světlá), became the wife of the high school teacher P. Mužák, and she devoted her time to social questions in addition to writing.

Podlipská and Světlá, together with Marie Riegrová-Palacká (the daughter of the historian F. Palacký and wife of the politician F. L. Rieger), understood that unless women had a profession and could find employment on the labour market, their social status would remain at the level of servants or workers and they would remain fully dependent on men. The biggest social problem facing them was the problem of single mothers. Thanks to the initiative of these intellectuals, the **Czech Manufacture Association** (**Český výrobní spolek** -1865[1]) was founded. It was the very first female industrial school, and led to the foundation of the **Women's Manufacture Association** (**Ženský výrobní spolek**) in 1871, with K. Světlá as a head. The association offered women general and specialised education (drawing, engraving, language education, administrative skills, economic education, medical assistant education etc.). The association also published an influential magazine called ***Women's Letters*** (1873) under the leadership of E. Krásnohorská, with editorial support from S. Podlipská. E. Krásnohorská (writer and poet, librettist of Smetana's operas) gradually became the leader of the Czech women's movement. In the magazine she took care to almost completely suppress the 'typical women's' topics that cram similar journals today. Searching the magazine for fashion outfits or culinary specialities would have been in vain. Instead, the magazine became an efficient co-ordinator of women's emancipatory endeavours, an organisational centre in the effort to gain access to higher education for women, as well as a disseminator of information about the activities of the national and international women's movement.

The **Higher Girls' School** (**Vyšší dívčí škola**) opened in Prague in 1863 and was targeted at the middle and upper classes. It was the very first institution to provide women with a high school education but without a school leaving exam. In 1867 the school moved to a decorative building in Vodičkova Street by the architect Ullmann. Many of those who later became famous celebrities of Czech culture graduated from the school, including the painter Zdenka Braunerová, the soprano soloist Ema Destinnová, the writer Helena Malířová and the actresses Hana Kvapilová and Růžena Nasková, to name just a few.

Women's organisations

'You invited your female compatriots to acquaint them with the machines which when introduced will mean a wonderful saving of time and money. Many people saw only the machines and calculated the advantages resulting from their use. However, we understood that what you were actually showing us was how to use them to free us from the shackles of hundreds of years of prejudices that have prevented us from participating in the intellectual world (…) You, sir, are to be honoured to be the first in the nation to have understood the misery a woman feels when there is a slumbering talent in her chest and she has to suppress it because society does not and cannot use it (…). Yes, we will study, we will educate ourselves, and we will ignore mockery, jokes and shrugging shoulders. There is no victory without battles and we want to, and have to, finally become human beings since that is what the spirit of these times requires and woe on those who with apathy stand aside.'

Address of Czech Ladies to Vojta Náprstek, 1863

At the end of 1862, the patron and philanthropist Vojtěch Náprstek created a sensation with his industrial exhibition of technical novelties on Střelecký Island. The mechanical household apparatuses that could liberate women from useless hard work and free their time for education attracted the most attention. Hundreds of women attended Náprstek's lectures about feminist movements in Anglo-Saxon countries and about women who had already made inroads into the world of professions. The women of Prague started to see Náprstek as a man on whom they could rely in their emancipatory endeavours, including getting a better education and better positions in society. Their passionate petition addressed to Náprstek in 1863, signed by 300 women, did not go unanswered. In 1865 the **American Club of Czech Ladies**[2] was founded in Náprstek's house 'U Halánků' in Betlemské Square. It was an important milestone marking the road leading to the opening of universities to women at the end of 19th century.

The club was not only the oldest women's organisation in the Habsburg Monarchy, it was also a centre of women's scholarship for women from the middle classes who could enjoy its rich expert library and listen to regular lectures (often with demonstrations) from all fields of the natural sciences, medicine, history, art, psychology, engineering and politics. Among the lecturers were leading Czech scientists (for example Purkyně, Vejdovský, Studnička, Goll, Masaryk), some ministers of the Austrian government and also fellow club members. The members had access to information about international women's movement, mostly from Náprstek´s famous 'scrapbooks' – books with cuttings from world newspapers. New horizons were opened for women as a result of excursions to factories, the observatory, and also to social work institutions, as charity was among the club's activities. In the first 25 years, the library was visited by 84,704 women, i.e. over 60 in one day, and almost 27 000 women attended its lectures, i.e. 50-60 per lecture on average.

This 'critical mass' contributed to the realisation of the aforementioned Woman's Manufacture Association and to the forming of other women's organisations, not only in the Czech lands but in other regions of the Monarchy. It was in the circles around the American Club of Czech Ladies and the Women's Manufacture Association that women found the support for their push for access to higher education. It is also worth mentioning that the **Women's Czech Club** (**Ženský klub český** -1903) was oriented not only toward education but also toward political issues, particularly on women's suffrage. Charlotte G. Masaryková, an American by origin and the wife of the president of newly-established Czechoslovakia, was also engaged in its activities.

School leaving exam and university education

At the beginning of the 1870s, it was three young members of the American Club, A. Bayerová, B. Kecková and J. Kurková, who were the first women with the courage to study in Switzerland (because it was impossible to do so in the Austro-Hungarian Monarchy). The first two finished their medical studies under difficult conditions, and the third died before her graduation in philosophy. Initially, young Czech female doctors could not open their practice in the Austro-Hungarian Monarchy. It was not until 1892 that A. Bayerová secured the position of an official medical doctor in Bosnia and Herzegovina where she treated Muslim women – a year later B. Kecková replaced her. However, most Czech women did not have the courage of these pioneers, though they observed their fates with excitement and sympathies. Starting in 1878, women were officially permitted to take a school leaving exam at male secondary schools, but there was no secondary school that would prepare them for the exam. Moreover, educated women had little chance of pursuing a profession in the Cisleithan part of the Austro-Hungarian Monarchy, and the statistics bear this out. In 1880 there were only 33 women-teachers or governesses in public institutions per 10 000 employed women, and only 30 hospital attendants and 7 artists, writers or editors. However, these numbers do attest to the fact that female 'intellectual' professions were at least tolerated at the time. Thanks to the democratisation of public life, the strengthening of the Young Czech Party, the formation of the Social-Democratic Party and the division of the Charles University into Czech and German University in the 1880s, the political and social situation was more inclined toward extending more equal treatment to women in education.

In 1890 E. Krásnohorská pushed through the foundation of the **Minerva Club** with a precisely defined project goal: to open a women's secondary school as a necessary precondition for women to be able to enter universities. A petition, written by Krásnohorská and published in *Women's Letters*, was addressed to the Reichsrat and included a demand that women be allowed into universities and professions reserved for men. The petition met with a favourable response. Among the 4810 signatures supporting the petition were the names of prominent Czech intellectuals as well as the names of members of women's organisations from the Czech lands, Bulgaria and Hungary. The Reichsrat was suddenly overwhelmed with other petitions dominated by Viennese women's corporations representing some 3 500 women members. As a result of strong social pressure and political support coming mostly from some Czech members of the Reichsrat, the obsolete legislation was changed, and, in September 1890, 51 students passed the gates of Minerva, the very first girls' secondary school in Central Europe. Inspired by the Minerva model, a girls' secondary school was founded in Vienna in 1892. The first 16 Minerva students took the school leaving exam in 1895 at the Academic Secondary School where they had to face much more difficult requirements than their male peers.

In theory there was no obstacle to women's higher education because there already was a ministerial resolution from 1878 which allowed women to attend university lectures 'appropriate to women', though the resolution was never enforced. Nevertheless, five women who applied to the Medical Faculty for permission to study were rejected. It was only after difficult negotiations, obstructions as well as expressions of tolerance from university teachers, that there began to be some gradual progress, which lasted until the establishment of the first Czechoslovak Republic. Gradually, universities were fully opened to women in the Czech lands, and later in Slovakia. The following chronology will explain more (see Masnerová 2002; Mikovcová 2004; Musilová 2002; Svobodný 2004; Štrbáňová 2004).

1895 Philosophical Faculty of Czech University accepts six Minerva graduates to sit in on classes
1895 Medical Faculty of German University enables three Minerva students to attend lectures
1896 Medical Faculty of Czech University allows women to sit in on classes
1896 Austria accepts foreign women's diplomas; however, they have to be validated by Austrian universities
1897 Philosophical Faculties of Austrian Universities admit women to study
1900 Medical and Pharmaceutical faculties of Austrian universities admit women to study
1900 Eight Czech women graduate from the Philosophical Faculty of Czech University, mostly with pedagogical approbation for various fields in the natural sciences. They are hired as teachers by the Minerva secondary school and the Vesna secondary school in Brno
1901 Doctoral graduation of M. Z. Baborová at the Philosophical Faculty of Czech University (major in zoology); the mathematician M. Fabiánová obtains a doctoral title later the same year
1902 A. Honzáková graduates from the Medical Faculty of Czech University
1908 Eight women graduate from the Pharmaceutical Faculty of Czech University
1908 Foundation of the Association of Academically Educated Women
1909 B. Nevšímalová appointed assistant at the clinic for infant diseases

The First World War: the number of female students increases as women take up the places made available by men going to war.

1912 The writer B.Viková-Kunětická is the first woman elected as deputy to the Assembly of the Czech Kingdom
1918 A principle in the Washington Declaration[3] states that women will be politically, socially and culturally equal to men
1918 Foundation of the Czechoslovak Republic
1918 Women receive the right to vote
1918 Law Schools admit women to study
1920 Article 106 of the Constitution of the Czech Republic declares that sex-based privileges shall not be recognised
1920 Czech Technical University admits its first 20 regular female students
1921 The first female Czech chemist, H. Fischerová, graduates from the Czech Technical University; the architect Petříková-Pavlíková graduates (designer of the house of Czech Women's Club at Ve Smečkách Street No. 22)
1922 Foundation of the Association of University Educated Women
1922 E. Krásnohorská is the first woman awarded Doctor Honoris Causa by Charles University
1925 M. Paulová is the first woman at a Czech university to be awarded associate professorship (in history FF CHU)
1937 Markéta Bezpalcová is the first female forestry engineer to graduate (she was never actually employed).
1939 M. Paulová appointed the first female university professor in Czechoslovakia; the actual appointment occurred in 1945 after the war but was retroactive
1945 First five female students admitted to the Faculty of Forestry and Environment in Prague
1954 J. Hamáčková appointed professor at the Institute of Chemical Technology in Prague; she was the very first woman to hold this position at a technical university.

Women Scientists during the period of the first Czechoslovak Republic

After 1918 there were no legislative barriers preventing women from studying at universities and the number of university educated women increased dramatically. However, there was a barrier that prevented women from finding employment in academic or managerial positions and in participating in political and public life, a very low glass ceiling. According to one of the statistics gathered, in 1930 (the year when Minerva's 40th anniversary was celebrated) the numbers of Czechoslovak female university graduates employed in the professions was as follows:

Doctors	645
Secondary school teachers	535
Pharmacists	210
Engineers, technical universities graduates	162
Lawyers	92
Engineers of Economy	61

No matter how impressive these numbers may seem when compared to the past, they make it immediately obvious that not every female university graduate had a chance to pursue a qualified profession, and many of them chose marriage over 'career.' Women faced the most severe obstacles when trying to get into politics, state administration and science; it was not until 1925 that a lawyer alumnus obtained a position in her field. The glass ceiling was very striking at universities; universities very rarely offered an academic career to a woman (Musilová 2002; Štrbáňová 2004).

The best conditions were probably those enjoyed by medical graduates, especially in the new Czechoslovak Republic, where about 1200 female doctors had graduated from Charles University by 1939. The same applies also to women's academic careers. Between 1909 and 1939 there were 163 women at the Medical Faculty of Charles University, i.e. about 14% of the total 1126 assistant professors. However, this low number still represented quite a high number compared to other universities and fields of study in Czechoslovakia. Most of the assistant positions for women were at the faculty hospital and in the policlinics – in dentistry, paediatric, dermato-venerology and neurology departments, and also in chemical and anatomical institutes, that is, medical fields that are less attractive. Moreover, an assistant position represented the peak of a female doctor's academic career because as of 1939 there were only two female doctors with the title of assistant professors in the Czech lands: V. Říhová-Knappová (1932) and O. Valentová-Denigerová (1933), both dermato-venerologists (Svobodný 2004).

The situation at other faculties and in other fields was even worse. For example, at the Faculty of Natural Sciences of Charles University, women successfully defended about ten doctoral theses per year; however, these women with PhD degrees for the most part ended up as teachers at girls' secondary schools, and only a very small percentage of them became scientists or university professors. Before 1938 this faculty had appointed only four women to the position of assistant professor, two of them at the Institute of Physical Chemistry headed by the future Nobel Prize Laureate J. Heyrovský, who actually supported female academic careers. Only two women habilitated – A. Dratvová (1932, philosophy of natural sciences) and J. Moschelesová (1934, anthropogeography). The Philosophical Faculty of Charles University awarded four associate professorships in history to women: M. Paulová (1925) and F. Kleinschnitzová (1929), the archaeologist R. Vacková (1930) and the ethnographer D.

Stránská (1932). Before 1939 there was not a single female professor at Charles University, although M. Paulová was appointed a full professor in 1945 with retroactive validity from 1939. Though pre-war Czechoslovakia was one of the industrial powers, women only occasionally applied for technical fields. There were a few assistants at the Czech Technical University, however, there were no associate or full professors. Among the 700 members of the Czechoslovakian Society of Chemical Engineering, there were only nine women in 1930. Not a single woman studied at the Forestry University in Prague until 1930; it was not until 1945 that the first six women were admitted (Mikovcová 2004).

Again, it was the women's organisations that advanced the interests of women with university degrees. **The Association of Academically Educated Women**, founded in 1908, was followed by the much more active **Association of University Educated Women** (1922), where A. Honzáková and M. Horáková were active. There were few men who supported the feminist movements, but among them were T. G. Masaryk and J. Heyrovský.

Brief evaluation of the period

Looking back at the period, we see that the process which resulted in women being permitted to study at universities at the end of the 1890s lasted about 70 years in the Czech lands, and lagged behind the development in other countries such as the USA or Switzerland. However, the Czech women's movement represented a vanguard in Austro-Hungary because of its steadfastness and organisation. The main characteristics of this period are the following:

- Although the programme of the National Revival did not devote much attention to the higher education of women, the general erudition of the nation was considered an important issue, which in a limited way also opened the doors to the education of women.
- The National Revival built on the ideology of the equality of nations; the idea of the equality of sexes followed easily from this. However, this idea was recognised by only a small percentage of the educated male population.
- The most decisive factor in attaining the main goal (the foundation of girls' secondary schools and opening universities to women) was the revival of club and political life in the second half of the 19th century. Grassroots organisations of Czech women, lead by quite a small circle of women intellectuals (mostly writers or teachers because women were not allowed or tolerated in other intellectual areas), were easily able to capitalise on this revival. However, the support of male politicians and intellectuals and models to emulate abroad were crucial to the success of women's grassroots movements and for establishing and implementing the relevant legislation.

It seems there was no striking progress in the social employment of university educated women in pre-war Czechoslovakia. Society tolerated only some professions for university educated women: mostly teaching, some medical fields, pharmaceutics, and for lawyers the profession of notary public. 'The effort of female university graduates to reach equal access to intellectual occupations was even more difficult as society still accepted gender stereotypes (…) Gainful employment was (…) considered a luxury that takes women away from the role of mothers, wives and housekeepers.' (Musilová 2000: 178–179). During the economic crisis of 1929-1933, women competed with men in the struggle for work opportunities. However, it seems that by the end of the crisis Czech society had become accustomed to the idea that women could take on traditionally masculine positions. As before, this progress was undoubtedly the result of the effect of foreign models, women's grassroots organisations and some of the female leaders considered as role models. In addition to E. Krásnohorská, we should also mention her modern followers: A. Masaryková, doctor A. Honzáková, Senator Fr. Plamínková, member of parliament M. Horáková, the aforementioned associate professors and some writers and artists. We should not underestimate the support of some prominent male intellectuals, especially T.G. Masaryk. However, progress was short-lived, cut short by World War II and the onset of communism.

THE PERIOD OF COMMUNISM

The communist period was not a homogenous one; in the most severe times (before 1956), women were executed, among them M. Horáková. The archeologist R. Vacková, the second woman to be appointed professor at Charles University (appointed in 1947, with retrospective validity from 1941), was imprisoned during the occupation and in a 1952 political process sentenced to 22 months in a prison for heavy offenders. There she gave lectures to her fellow prisoners under the most brutal conditions. When considering the position of women scientists under the totalitarian regime, we must also consider their political attitudes.[4] (Pousta 2002)

The more liberal atmosphere of the 1960s ended in the despair of Normalisation. A more detailed study would probably reveal that each of these periods also manifested itself in how women were accepted in science, how they advanced to leading positions and what problems they faced. While the present situation of women in science is being monitored, there are still very few studies with information that can be used to perform an objective evaluation of this period. For these reasons, the following reflections about this difficult period will be slightly simplified and probably also distorted by the personal experiences of the author.

The position of women in science during the period of communism was the result of many factors (see Bádají ženy jinak? 2002). The first factor was the totalitarian regime itself. Although the regime externally claimed equality, it did very little for the real equality of women and men. It just increased the employment of women in economically disadvantaged fields, and the economic disadvantage was exacerbated by the political situation. Gender problems definitely existed under the totalitarian regime; however, they were ignored, (and I am not afraid to claim that they were also) mocked and tabooed.

Another factor was the previous historical development (see Bahenská 2005; Musilová 2002; Štrbáňová 2004; Štrbáňová, Stamhuis a Mojsejová 2004; and other literature cited in these works). Among other things, the legacy of the past could be seen in that society traditionally accepted women only in certain fields – in medicine, teaching professions, pharmaceutics, humanities, and artistic professions – but excluded them from other – mostly technical – fields. What was new was that women entered the natural sciences. Women worked in badly paid and socially undervalued teaching positions and less prestigious positions in medicine and research. In some professions there were sometimes more women than men; this process was pejoratively called 'feminisation'. In the eyes of the public, feminisation was not only a mark of poor quality but also a synonym for its degradation whilst the reason was mistaken for a consequence[5]. The percentage of women in leading positions was even lower in those fields where the number of university-educated women equalled the number of men. Even in 2005, most women at Czech universities occupied the positions of assistant or assistant professor (about 40%), and made up only 20 % of associate professors and 7% of full professors, although one third of the research-pedagogical staff were women (Kraťková, Motyková 2007). During communism the situation was probably similar or possibly even worse; and this poor situation was further compounded by the fact that for the most part only Communist Party members could occupy leading positions.

The low number of women was most visible in technical fields, which were traditionally considered to be a male domain (Masnerová, 2002). As an example: the first professor to be appointed at a technical university was J. Hamáčková in 1954, in the field of chemistry of water (Masnerová, without date specification). It is necessary to add that in the 1920s and 1930s, when J. Hamáčková was an assistant at the Institute of Chemical Technology in Prague, interest in the field was very marginal as capable chemists were attracted mostly by the various fields of inorganic and organic chemistry; graduates in these fields held prestigious positions in development laboratories or industry. It is thus understandable that when a chemist was sought for a newly built water purification plant in Prague-Bubeneč in 1926, not many men were interested in the position. Hamáčková was. It was a typical niche occupied by a woman in order to launch a unique scientific carrier in a young field with no competition from male colleagues. J. Hamáčková became a respected pioneer in the technology of water, which is also documented by the fact that in the years 1957/59 she was the first woman to be appointed a dean (the Faculty of Chemical Technology of Fuels and Water of the Institute of Chemical Technology in Prague). Despite her great scientific and pedagogical achievements her name is still missing from most Czech biographical dictionaries, which is one of the reasons why many prominent (and not only Czech) women are not publicly known.

As for women in other technical fields, the statistics in forestry – a field hardly mentioned – are extreme. Although women made up about 10% of students, only nine of them obtained the doctoral degree between 1952 and 1989 in the Czech lands (Mikovcová 2004).

An important circumstance that further exacerbated women's chances of applying for leading positions was the complete lack of women's civil organisations in the country; in the more democratic times of the past, women could rely on such organisations. The Czechoslovakian Women's Union was the only organisation tolerated by the regime; however, its work was strictly connected to the official communist party line.

Between 1952 and 1989, there were only four women directing institutes of the Academy of Sciences of the Czech Republic. The first were not elected to the Academy until the Prague Spring of 1968; 11 women became members-correspondents and four became Academicians prior to 1989. Let us remind ourselves that there were 500 male Academicians and members-correspondents before 1989. Contrary to all expectations, only one female Academician represented the humanities; all the others became outstanding in natural sciences and technical fields (Barvíková a Martinovský 2004).

What was the situation in the workplace? Although initially it may seem that there were a lot of women working in research, even holding the titles of candidate or doctor of science, they rarely occupied a leadership position. Disadvantaging women in research took other, less obvious though effective, forms that differed from workplace to workplace. Men in leading positions (mostly members or functionaries of the Communist Party) often surrounded themselves with capable and efficient women whom they expected to produce results, but who did not threaten their career advancement. It was no exception that women had lower salaries and bonuses than their male peers although they occupied the same scientific position; they also had reduced technical assistance (e.g., lower chances of using laboratory technicians and secretaries). The rule was that they had to include their superiors as co-authors of publications even in cases where they had taken no part in the research whatsoever. As a woman-scientist I have heard more than once from my male colleagues that men are more equipped for conceptual work and that women, with their sense for detail and their diligence, are more suitable for developing their original ideas. In view of the fact that there were only a few research positions and that women were 'handicapped' because they also had to take care of babies, they usually accepted the position offered (especially if they were not party members) and readily performed any job so that they could stay in the field they loved.

Even though women-mothers-scientists could take advantage of quite a dense network of day care centres and kindergartens, they could only use them if they placed their child there for the whole day as most workplaces did not tolerate shorter or flexible working hours. Female researchers who used the legitimate and state guaranteed sick leave to take care of sick children were looked down on with disdain. However, the care of children was the most often acknowledged reason for the discrimination of women in leading positions.

It is obvious that here I am veering toward personal experience. When I came back from a postgraduate research fellowship at the Harvard Medical School in the USA in 1965, I was appointed (still without a certificate) leader of a laboratory at the Institute of Microbiology of the Academy of Sciences. About two months later, one of the team members was transferred to another laboratory, which meant that the number of people in my laboratory fell below the minimum required for a laboratory unit, and thus my lab no longer qualified for the position of an independent lab, including the bonus for being its head. I had to return some of the money that I had received (allegedly by mistake). About a year later our superiors wanted to claim as their own the results of our all-woman team by omitting our names as co-authors in a research publication; this publication was being prepared for a specialised symposium in England which only these men were allowed to attend. After my protestations on behalf of the team members, our names were added to the paper without any explanation, and this became one of our most cited papers. In this environment there was subtle psychological pressure based on the notion of a woman as a second-class person. In all other respects the environment was friendly enough, which was also manifested by the fact that the group of men in power called themselves 'boys' and women were called 'girls' *en mass* in the sense 'so, how are you doing, girls?' or 'let's tell the girls to do it'. However, it was actually impossible to imagine that we would have called our bosses 'boys'. At departmental meetings women scientists were called 'comrade' while the men were called 'doctor'. I caused a stir one day when I asked why women were not also referred to as 'doctor'. Contrary to my expectation, my question did not cause any inconvenience; on the contrary, men at my department started to behave more appropriately toward their female colleagues. These events provoked a change in my personal attitudes. I started to shed my deeply rooted fears and uncertainties and to realise how important it was to oppose discriminatory practices that are sometimes almost unnoticeable, and yet at the same time very effective (compare also with Havelková 2007).

I had a similar politically-motivated experience during the Normalisation period in the ideology-driven Institute of Czechoslovakia and World History of the Czechoslovakian Academy of Sciences where women, especially those who were not party members, were expected to work extremely hard. Sometime in the 1980s, on the occasion of a celebration of International Women's Day (a very traumatic holiday for me), the deputy director, a 'die-hard' communist, had a speech in which he stressed his respect for the women in attendance whose hard work created a very supportive environment for scientists-men so that they could concentrate on research. I was the only one who had the courage to ask publicly if he took into account that there also were scientific women at the Institute. This was to cause me troubles in the years to come.

However, it would not be fair to see the situation of women in science in our country during communism independently of the situation of our colleagues in the democratic countries (see Havelková 2007). There is evidence that there were very few female professors and university functionaries even at Western universities in the 1960s, and that in many respects the situation of women scientists in the West was no different from the situation here. The recent 2005 affair concerning the statement made by Harvard University President Lawrence Summers that biologically determined dispositions hinder women from better performance in the natural or exact sciences highlights social prejudices unrelated to the political system that still hold sway. However, in one respect I can see a great difference. The feminist movement and human rights movement have dramatically changed the situation of women in science in the West; similar movements were banned under the communist regime. Apart from small personal revolutions, women could not influence their situations in any way under the totalitarian regime. As a matter of fact, the legacy of the communist regime is something that needs to be overcome not only in terms of men's minds and behaviour, but also in women's everyday practices.

BIBLIOGRAPHY

2002. "Bádají ženy jinak"? Pp. 139–250 in: Pokorná, M. (ed.). Semináře Výzkumného centra pro dějiny vědy z let 2000–2001, *Práce z dějin vědy 3*. Prague: Arenga.

Bahenská, M. 2005. *Počátky emancipace žen v Čechách. Dívčí vzdělávání a ženské spolky v Praze v 19. století*. Libri/Slon: Prague.

Barvíková, H., Martinovský, M. 2004. "Memberships of Women in the Leading Learned Institutions in the 20th Century". Pp. 189–220 in: Štrbáňová, S., Stamhuis, I. H., Mojsejová, K. (eds.). *Women Scholars and Institutions, Proceedings of the International Conference (Prague, June 8–11, 2003)*. Studies in the history of sciences and humanities, 13 A, 13 B. Prague: Research Centre for the History of Sciences and Humanities. This work includes an extensive list of other literature.

Havelková, H. 2007. "Transformace, která nikdy nezačala". Pp. in: Linková, M. (ed). *Tran/sformace: gender, věda a společnost.* Prague: Institute of Sociology of the Academy of Sciences of the Czech Republic.

Kraťková, D., Motyková, J. 2007. "Ženy v terciárním školství v České republice." Pp. in: Linková, M. (ed.). *Trans/formace: gender, věda a společnost*. Prague: Institute of Sociology of the Academy of Sciences of the Czech Republic.

Masnerová, J. 2002. "První studentky na pražské technice". Pp. 181–187 in: Pokorná, M. (ed.). Semináře Výzkumného centra pro dějiny vědy z let 2000–2001, *Práce z dějin vědy 3*. Prague: Arenga.

Masnerová, J. 2004. "Profesorka Julie Hamáčková, jedna z prvních absolventek ČVUT". *Pražská technika: časopis českého vysokého učení technického* 4, pp. 49-50.

Mikovcová, A. 2004. "Phenomenon 'Woman' at the Faculties of Forestry in the Czech Lands in the 20th Century". Pp. 509–534 in: Štrbáňová, S., Stamhuis, I. H., Mojsejová, K. (eds.). *Women Scholars and Institutions, Proceedings of the International Conference (Prague, June 8–11, 2003)*, Studies in the history of sciences and humanities, 13 A, 13 B. Prague: Research Centre for the History of Sciences and Humanities. This work includes an extensive list of other relevant literature.

Musilová, D. 2002. "Uplatnění absolventek vysokých škol v období první republiky". Pp. 171–180 in: Pokorná, M. (ed.). Semináře Výzkumného centra pro dějiny vědy z let 2000–2001, *Práce z dějin vědy 3*. Prague: Arenga.

Pousta, Z. 2002. "Ženy nebádají jinak!." Pp. 163–170 in: Pokorná, M. (ed.). Semináře Výzkumného centra pro dějiny vědy z let 2000–2001, *Práce z dějin vědy 3*. Prague: Arenga.

Svobodný, P. 2004. "Women Docents and Professors at Medical Faculties in Czechoslovakia, 1918–1939". Pp. 375–399 in: Štrbáňová, S., Stamhuis, I. H., Mojsejová, K. (eds.). *Women Scholars and Institutions, Proceedings of the International Conference (Prague, June 8–11, 2003).* Studies in the history of sciences and humanities, 13 A, 13 B. Prague: Research Centre for the History of Sciences and Humanities. This work includes an extensive list of other relevant literature.

Štrbáňová, S., Stamhuis, I. H., Mojsejová, K. (eds.). 2004. *Women Scholars and Institutions, Proceedings of the International Conference (Prague, June 8–11, 2003).* Studies in the History of Sciences and Humanities, Vol. 13 A, 13 B. Prague: Research Centre for the History of Sciences and Humanities, pp. 861.

Štrbáňová, S. 2004. "The Institutional Position of Czech Women in Bohemia 1860–1938". Pp. 69–97 in: Štrbáňová, S., Stamhuis, I. H., Mojsejová, K. (eds.). *Women Scholars and Institutions, Proceedings of the International Conference (Prague, June 8–11, 2003)*. Studies in the history of sciences and humanities, 13 A, 13 B. Prague: Research Centre for the History of Sciences and Humanities. This work includes an extensive list of other relevant literature.

Endnotes

1 The year 1863 is mentioned in some literature.

2 The American Club of Czech Ladies still exists today. Although it survived Nazism, it was cancelled by the Communist Party in 1948. It was re-established in 1996.

3 Declaration of the Czechoslovak Republic.

4 R. Vacková was active in the Political Prisoners Club K 231; she signed Charter 77 during the Normalisation period in the 1970s.

5 This situation is the same today. I quote from the work by Kraťková and Motyková (unpublished material) 'Women concentrate in fields like social sciences, pedagogy, medicine, and biology, and the different salaries reflect this situation. The fields with a higher percentage of women are considered less prestigious or less difficult than those dominated by men. Fields with minimal participation of women and with strong theoretical orientation have high status (such as theoretical physics).'

Women in Science after 1989: Czech Activism and European Debates

Marcela Linková

Activities aimed at achieving equal opportunities in research and development in the Czech Republic after 1989 developed at the intersection of European policies and critical feminist approaches developed by the National Contact Centre for Women in Science (NCCWS)[1]. The activities combine two approaches or discourses which complement each another in many respects, but in others emphasise different aspects, values and starting points.

Debates on the position of women in science were initiated by feminist activities in the 1970s and were centred on the low representation of women in science, especially in top decision-making positions, as well as on issues pertaining to knowledge production. At issue was not only why there were so few women in science (despite the growing numbers of women in universities and among doctoral candidates), but also the type of knowledge that was produced, what (gender) bias it carried, the position from which researchers 'speak' when presenting their theories, and the impact these theories had on the fabric of society. The nature of knowledge presented as objective and impartial was contested. Approaches developed in postcolonial and feminist studies, for example, concentrated on how science was complicit with dominant racist or misogynist theories which promoted the dominant position of white Western men to the detriment of other races, cultures and women. The approach to the nature of knowledge has changed; the objectivity of scientific knowledge has been redefined, as has the relationship between the researcher and the researched, and the emphasis is now on the reflexivity of research practice. That which at one time explained now requires explanation.[2] However, these critical theories, developed in various streams of thought, have long failed to penetrate the higher echelons of science policy.

The issue of women in science appeared on the political agenda of European research and development as late as the 1990s as a result of pressure from West European organisations of women in science. At the end of the 1990s, the issue was promoted by Edith Cresson, then EU Commissioner for Research and Technologies, and gradually the Women and Science Unit was established at the Directorate General for Research, Technologies and Development (since Framework Programme 7 the unit has been called Scientific Culture and Gender Issues, suggesting a shift in perceptions on the position of women in science toward a wider conceptualisation of gender equality in terms of science culture as a social process). From the beginning, the activities of the European Commission (the EC) in support of women in science have centred on three aspects: science with, for and about women. This triple emphasis covered various aspects of the issue: a) the numerical representation of women in research; b) the specific needs of the female population (for example, compared to prostate cancer, research into breast cancer was long under-financed; clinical trials were conducted on men, but the results applied to both men and women); and c) the understanding that science offers of the relationships between men and women does not only entrench and reproduce the dichotomous, and in many ways discriminatory view of the roles of men and women in society.

However, the Women and Science Unit has had to battle a lack of interest at the level of the EC and its representatives, as well as at the level of member and associated countries. The inclusion of the gender dimension in Framework Programme 6 for the years 2002–2006 demanded the concerted effort of the entire unit and the active participation of other actors (such as the Helsinki Group for Women in Science[3] and European networks of women in science). As the EC failed to devote sufficient attention to the importance of this step and its potential contribution to increasing the quality of research to explaining to the research community, the demand to include the gender dimension in Framework Programme 7 was withdrawn, with the justification that the research community 'did not feel comfortable'[4] and the gender dimension would be taken into account only where relevant. This occurred despite the fact that this type of research shows the importance of the gender lenses for research in biomedicine and social-science research, and research on security and food safety, the environment and other areas.

The position of women working in research and development continues to receive attention. However, on its journey through the legislative and policy-making machinery the issue has lost its feminist and equal opportunities charge, and policy documents now emphasise the economic aspects of a higher percentage of women in research. Activities aimed at supporting women in research are thus generally framed by the economic imperatives of the Lisbon Strategy, the necessity of attracting and retaining young people and (especially) women in science, and the economic development of national economies in Europe. These documents, and the EU representatives responsible for research, technologies and innovations, do not emphasise equality but rather economic profit, although from the perspective of the traditional image of research as an objective and impartial tool of knowledge-making where individual talent, creativity and personal zeal are rewarded, equality is a value that should receive considerable attention.

That things are changing is indisputable: some funds are now allocated to address gender inequalities in science at the level of the EU[5] and national governments[6], but from theoretical positions that cement the current arrangements and demands on a research career and that fail to open room for reconsidering how we could think about science. For example, in terms of work-life balance programmes and projects are built on the premise of the traditional division of labour in the private and public spheres and do not examine the ways in which this division of spheres and roles of women and men could be rethought. On the contrary, all efforts are aimed at creating opportunities for women to adopt masculine work habits, making it possible for them to behave in research as had so far been possible only for men (long work hours made possible, for example, by on-site childcare, the rapid return to work following parental leave and financial contributions for childcare). No attention is given to ways in which male researchers could rethink their paternal and partnership roles, ways to address the unequal distribution of work in the family etc. As a consequence, the double burden system is retained, the difference being that ways are sought to make the performance of the second shift easier for women.

Another example is the great emphasis found in all policy documents on the need to increase the attractiveness of technical and natural sciences for young people, especially for women who have traditionally been represented in these disciplines in small numbers. Programmes have been launched to popularise science and to make it more attractive. But there is no indication that funds are being allocated to studying why the social-scientific and humanities disciplines are more attractive to young people (apart from the usual sigh that young people think that natural sciences and engineering are difficult and demanding). Can it not be a result of how scientific knowledge was used and abused in the 20th century? Or a lack of clarity regarding the direction that research is heading in today without meaningful social debate taking place on the issue of ethics and stem cell research etc. (i.e. topics which fundamentally concern our ideas about who we are, what our body is, in what ways we will reproduce etc.)? And why is it, in fact, considered to be a problem that young people prefer to acquire critical thinking offered by social-science and humanities disciplines rather than the type of cognitive work customary in natural sciences? Is the goal only that schools should produce a labour force for the entrepreneurial and private research sectors?

Apart from women's activism during the First Republic, the issue of women in science first appeared in the Czech Republic around 2000.[7] Arguably, the European Union played a key role in this. At the very end of 1999, during the Finnish Presidency, the Helsinki Group for Women in Science (HG) was established. Because the Czech Republic was a country associated to the 6th Framework Programme, it was also called upon to appoint its representatives. In order for the CR to be able to meet its commitments to the HG, by 2000 a Steering Committee for Women in Science had been appointed[8] and in 2001 the National Contact Centre for Women in Science was established. At the beginning the activities tended to be reactive – two reports were drafted as an HG activity by PhDr Hana Havelková, PhD and PhDr Marie Čermáková. As there were no networks of women scientists in the CR or any hints of activism in this area at the time, it was possible to establish how the issues related to gender equality should be tackled and thematised.

From the beginning, the NCCWS[9] considered it important to frame the issue of women in science as consisting of two issues which broadly corresponded to the approach of the Women and Science Unit: the issue of the position of women in science and the issue of gendered processes of knowledge production. At the international level, the NCCWS has established itself fairly easily and quickly. It established contact and joined in the activities of similar organisations. In 2003, NCCWS together with the EC organised a workshop on early stage researchers as part of the Enwise project and started participating in the Framework Programme 6 as a partner country and as a co-ordinator.[10] Through membership in an advisory commission and committees of the EC it has also contributed to debates about the direction of European research in terms of gender equality and the accountability of science.[11] This has provided insight into how it is politically acceptable to frame the issue of the position of women in science at a political level and to identify what the dominant discourses are which facilitate the drive for equality in science. Needless to say, in many respects the NCCWS is critical of these dominant discourses because they often only stress economic aspects, placing less emphasis on equality or the building of democratic science. Membership in advisory bodies also makes it possible for us to point to the links between the issue of gender equality and other aspects related to the accountability of research, governance and decision-making processes, or the issues related to a 'dialogic' or 'two-way' research communication and the issues of power built into them.

In the Czech Republic the situation was more difficult, perhaps because at the international level we joined a train that was just setting off and could participate in the debates and programmes from the very beginning. It must be said that there were no projects similar to NCCWS in any of the new accession countries, and thus for a long time we were the only partner organisation with institutional support. Nevertheless, even today the issue is not perceived as fundamentally important. Gender equality is a luxury we cannot afford – if the question stands 'whether to finance a biotechnological research centre, for example, or activities in support of women in science' the answer is clear.[12] It is clear that what is at stake is a political decision to address the issue – in a way the decision is as political as whether to address the issue of attracting young people to natural and technical science, supporting of European mobility in research, supporting small and medium-sized enterprises or the issue of socially accountable research which is open to discussions with civil society.

Therefore we strive to orient our activities in such a way that the issue of gender equality in science is recognised at the policy level in the Czech Republic and at the same time becomes relevant for women researchers and research institutions. We develop various projects with the goal of explaining the gender aspects of the issue (e.g., work-life balance, mobility of early stage researchers, educational and career paths etc. in the project Woman of the Month and Young Talents), to stimulate debate (e.g., through our newsLetter, website, publications or conferences and workshops) and in this way, through recommendations, to introduce the topics to actors responsible for research and development policy (the Ministry of Education, Youth and Sports, the Council for Research and Development, the Czech Rectors' Conference, the Academy of Sciences of the Czech Republic, grant agencies etc.). We also participate in research projects dealing with knowledge production and the position of women in science. This provides us with greater insight into the functioning of research institutions, the decision-making strategies of young men and women and the expectations of institutions and the researchers themselves. The research results thus contribute to defining what concrete activities to consider.

Communication with the research community, especially women researchers, is crucial for NCCWS. Unlike countries in the West where women's activism in research can boast of a history extending back for over thirty years and where women's organisations actively participate in the advancement of equal rights for women in science, the Czech Republic has no such history and there is no women's network with elected representatives and a decision-making structure. In this respect the NCCWS functions as a 'spokesperson'[13] which represents the interests of women researchers – and it is precisely because of this that the feedback and information about whether what we promote is relevant from the perspective of the experience of women researchers is so essential.

In the Czech Republic the position of women in science and the gender aspects of knowledge production are slowly becoming issues which can no longer be easily brushed aside as irrelevant. Nevertheless, it is necessary to negotiate which topics and areas can be introduced into policy debates, to identify the limits of what is acceptable for the state administration and research institutions, and with what demands women researchers identify themselves. In a sense, the issue of equality still needs to be *smuggled* into the policy agenda. At both the European and national political levels it is difficult to promote equality and the demand for equal rights for women and men in research. The issue of equal opportunities is thus veiled behind the necessity of looking for tools to boost the economic development of societies. It is as if the fact that we live in a society where expectations are different for women and men, and that this has an impact on the alleged characteristics and, more importantly, the capabilities of the sexes, were taboo, or perhaps something that should be left untouched because it has been working for so long. Therefore, ways are sought to leave 'the something' alone and still meet the demands which women in various walks of life, including research, are raising in terms of their rights. From our perspective at the NCCWS it is important to stimulate critical examination of the gender system and the related organisation of research. Not only do we support women being able to participate more in research and make decisions about it within the given status quo, we also support debates about what type of science, using which methods, with what actors, serving whose purpose and with what goals, we should be building.

BIBLIOGRAPHY

Alcoff, L. 1991. "The problem of speaking for others". *Cultural Critique (Winter)*, pp. 5–32.

Latour, B. 1995. "The 'Pédofil' of Boa Vista: A photo-philosophical montage". *Common Knowledge*, 4, 1, pp. 144-87

Latour, B. and S. Woolgar. 1979. *Laboratory Life: the Social Construction of Scientific Facts*, Sage: Los Angeles.

Latour B. 1987. *Science in Action: How to Follow Scientists and Engineers Through Society.* Open University Press: Milton Keynes.

Linková, M. 2004. "Co si neuděláš, to nemáš aneb ženský aktivismus, gender a znalost". Pp. 143–164 in: Hašková, H., Křížková, A., Linková, M. (eds.). *Mnohohlasem: vyjednávání ženských prostorů po roce 1989.* Prague: Institute of Sociology, Academy of Sciences of the Czech Republic.

Endnotes

1 The NCCWS was established in 2001. It is a project of the Institute of Sociology of the Academy of Sciences funded by the Ministry of Education, Youth and Sports, under the EUPRO programme for supporting international co-operation in research and development (OK 457 and 1P OK 459).

2 This 'reverse' approach is adopted by various critical theoretical streams, and is most clearly articulated in social studies of science (see Latour 1995, Latour and Woogar 1979, Latour 1987). From the perspective of the topic at hand it is not relevant, for example, to ask why women do not have technical or logical thinking but which historical processes have caused us to think about women in this way.

3 This is an advisory body of the EC for the issue of gender equality in research and development which consists of representatives of national governments and gender experts.

4 'The scientific community did not feel comfortable'. Commissioner for Research Janez Potočnik at the Re-searching Women in Science and Technology conference in May 2006 in Vienna, in response to a question about why the gender dimension was abolished as an obligatory task in FP7.

5 Relevant EU documents and studies are available at http://www.cec-wys.org/html/index.php?s1=1&s2=8&s3=1&s4=1&lng=13.

6 For an overview of state activities in support of women and young girls in science in Europe, see http://www.cec-wys.org/html/index.php?s1=1&s2=8&s3=4&lng=13.
7 For a detailed review of women's activities in research and development, see Linková 2004 and Soňa Štrbáňová's chapter in this report.
8 The Steering Committee was appointed by the Ministry of Education, Youth and Sports and brings together representatives of the academic, higher education and industrial sectors, gender experts, a representative of the Technology Centre (the Czech NCP), the Czech Statistics Office and a person responsible for equal opportunities implementation at the Ministry of Education, and members of the HG.
9 I have been the co-ordinator of the NCCWS since its launch in 2001. The text that follows reflects my experience and the experience of my colleagues with the implementation of gender equality measures in science in the CR.
10 Datamwosci (2003–2004), CEC-WYS (2004–2007), KNOWING (2006–2008) a WS Debate (2006–2008).
11 Steering Committee for the Study of Women's Networks (2004–2005], Science in Society Expert Advisory Group (since 2006), Helsinki Group for Women in Science (since 2007).
12 This was revealed during of a project we carried out under the Central European Centre for Women and Youth in Science project (CEC-WYS, 6. RP, 2004–2007) during 2005 and 2006.
13 On the issue of speaking for others, see, for example, Alcoff 1991.

Equal Opportunities of Women and Men in Czech Science and Research

Hana Tenglerová

INTRODUCTION

In Czech science, equal opportunities for women and men[1] cannot be taken for granted (for example, see statistical data – Kraťková, Motyková 2007 and Stöckelová, Linková 2007). An analysis of relevant governmental documents and activities related to science policy makes it obvious that the status of the equality of women and men in science is still not perceived as an established political issue (Linková 2007; Smetáčková, Linková 2006; Smetáčková, Linková 2004; Tenglerová 2007). The aim of the activities of the National Contact Centre for Women in Science (NCCWS) is to change this situation. NCCWS activities include monitoring the attitudes of key actors and players (expert public as well as scientific institutions), supporting discussions about new measures and actions and regularly monitoring the implementation of equal opportunity policies for women and men in science.

In 2005, the NCCWS organised a workshop with women in leading and top positions at universities and in the Academy of Sciences of the Czech Republic (AS CR), and an international conference entitled *Paths through the Labyrinth: why there are still so few women in science* (further referred to as the Conference). Based on the presentations, follow-up discussions and best practice examples from abroad, recommendations and proposals[2] were drafted and addressed to various institutions of Czech science and research[3]. These institutions were asked for their reactions with respect to the potential implementation of the recommendations and proposals and also for information about any other planned activities supporting the equal treatment of women and men in science.

The following paper presents an analysis of the current situation. It is based on the reactions of institutions to these recommendations as well as on an analysis of accessible documents related to the situation of women scientists. I initially focus on how the measures supporting equal opportunities for men and women scientists in the CR are implemented. I then reflect upon the characteristics of the proposals for action that came out of the Conference. Finally I sketch out the plans and activities that NCCWS wants to pursue in order to advance equal opportunities for women and men in science.

So, what has actually changed since the 2005 Conference? Based on the monitoring of the situation, we can see obvious progress in some areas but the situation is far from perfect. One of the aims of the NCCWS is to support discussions about measures that may improve the situation of (not only) women in Czech science and research, as well as to support discussions about the acceptability and implementation of such measures. My goal is to present a critical reflection of the present situation, and also to evaluate the measures that institutions have taken thus far and to challenge them to continue along this path.

IMPLEMENTATION OF MEASURES AT THE INSTITUTIONAL LEVEL

Parenthood in tertiary education and grant systems

The response of the relevant institutions to measures designed to help eradicate disadvantages faced by students, and women and men scientists, resulting from taking maternity or/and parental leave, which were directed at higher education institutions as well as grant systems and schemes, was mostly positive.

The results of our monitoring suggest that many universities and colleges make it possible for doctoral students to interrupt doctoral studies specifically in order to attend to parenting. In addition to this case, student-mothers or parents can take full advantage of the classical option of interrupting their studies without being required to provide a specific reason[4]. Among universities and colleges, the adoption of such an attitude is increasing. However, it should also be noted that not every institution is willing to include this option in its doctoral studies system, or even anticipate making this option available in the future. Many institutions limit student-mothers or parents to the classical form of interruption, which is not included in the standard length of the study but which places student-mothers and parents at a disadvantage compared to their child-free colleagues. Important reasons for interrupting one's studies may arise for child-free students as well as for young parents. However, young parents cannot in that case claim the right to interrupt their studies because they would have already used this option for maternity and/or parental leave. The situation is even worse for student-mothers and parents in cases where there is a specifically defined period for finishing their doctoral studies with no option to use the classical form of interruption. However, today this approach is unusual and the first two approaches predominate.

There is a close link between the situation of student-mothers and parents and the discussion that has been taken up by the Council of Higher Education Institutions of the Czech Republic (CHEI CR) about eliminating the current age limit of 26 years for students' social benefits[5]. The loss of student benefits based on age discriminates not only those who decide to study at an older age, but also those students who take maternity and/or parental leave before they are 26. When students interrupt their studies, they automatically lose their student status and therefore their student benefits. Furthermore, if the parents are students, they also lose the years that they could be taking advantage of student benefits. CHEI CR and the Ministry of Education, Youth and Sports are univocal in their support for solving this problem. Let us hope that the possibility of cancelling the limit of 26 years for social benefits to students will be adopted.[6] The loss of student benefits based on age discriminates not only everyone who decides to study at an older age, but also those students who take maternity and/or parental leave at a younger age than 26. The interruption of study automatically means a loss of student status and therefore a loss of student benefits. Furthermore, these parents lose the years when they could – if being students – have enjoyed student benefits. CHEI CR and the Ministry of Education, Youth and Sports are univocal in the positive approach to solve this problem. Hopefully, we will see some concrete steps taken in this direction in the near future.

There have also been changes in the grant systems/rules of the Grant Agency of the Academy of Sciences of the Czech Republic (GA AS CR) and the Czech Research Council (Grant Agency of the Czech Republic, GA CR). One problem has been (and sometimes still is) the fixed age limit for junior or postdoctoral research projects. The age limit of 35 years of age very strongly affected those who opted for parenting and temporarily left their field.

Since 2006, the GA AS CR rules for junior projects have made provisions for these scientists: if the grant applicant returns to work from parental leave, the age limit can be extended by two years for each child. Moreover, once a grant is obtained, it is possible to postpone the start date of the grant for up to nine months[7]. These are clearly very positive steps forward; at the same time, while the main goal of such measures is to motivate young parent-scientists to return to research, it does not address the reduced chances of professional growth resulting from the decision to pursue parenthood. Thus, the exemption does not include those who have already returned to their field after parental leave.

The age limit for applicants for postdoctoral projects submitted to GA CR is 35 years. This can be extended according to the length of the maternity leave. Thus, 28 weeks can be added to the age limit of 35 years (with a maximum of 37 weeks in the case of multiple pregnancies). It is thus possible to extend the age limit in the postdoctoral project competition programme as well as to extend the period after the completion of doctoral studies. However, this is far from adequate. In fact, the grant system presupposes that the solution to the childcare issue is unproblematic. This presupposition is itself problematic in the Czech Republic, where the availability of relevant childcare services is quite inadequate (from the perspective of the availability and sparse distribution of childcare facilities), as well as from the perspective of the typical financial situation of young families. The system builds on the assumption that there is another person (and rarely is this person a man) to help the female grant applicant, who would be able to raise the baby immediately after the half-year maternity leave period. Once the half-year leave period is over the person is automatically judged as having the exact same opportunities to build up a professional carrier as her or his child-free colleagues or colleagues with older children. Taking maternity leave into account should be taken for granted but it is obviously not enough to make up for the disadvantage of researcher-parents.

There will be a change for the better with respect to projects that will start next year. The Documentation for the Public Competition in Research and Development for 2008[8] finally mentioned parental leave in addition to maternity leave as grounds for extending the established limits for grant applications. Furthermore, there is another positive change: the age limit of 35 years has been eliminated. The time limit will be given by the period after the completion of doctoral studies (set as four years) which grant applicants will have to meet. It will be possible to extend this period by the length of the maternity and/or parental leave. This means not only the abolition of the discrimination of student-mothers and parents but also the abolition of the age discrimination of all applicants for postdoctoral grants.

However, the same Documentation does not sound as positive when dealing with the conditions for doctoral projects. The 30-year age limit for applicants remains in place, with a somewhat vaguely worded postscript: 'this age limit can be prolonged in justified cases'[9]. There is no information about how to deal with parental and/or maternity leave. The grant system probably does not anticipate that parenthood applies to members of doctoral teams at this age.

The demand to interrupt and subsequently extend the grant implementation period because of the maternity and/or parental leave of the primary investigator turned out to be much more problematic. None of the grant agencies initiated any systematic measures to solve this situation. Based on the information obtained, GA CR deals with cases on an individual basis. For example, a woman-scientist who had to complete a doctoral project prematurely due to her motherhood was allowed to submit a new proposal for another postdoctoral project[10]. Such steps are undoubtedly positive. Compared to a systematic solution, the disadvantage of an individual solution lies in the impossibility of obtaining information about its specifics in advance. The insecurity or unfamiliarity implied by this approach can lead – and probably will lead – to only a fraction of the people who are its potential target group actually pursuing this option.

The Academic Council AS CR should have discussed these questions in 2006[11], as stated by the President of the AS CR Prof. RNDr. Václav Pačes, DrSc. However, the minutes available from the meeting do not show that the issue ever made it onto the agenda[12].

In general, it can be stated that the grant agencies and some universities took positive steps regarding measures related to maternity and/or parental leave – especially in the case of young scientists. The measures are formulated in a gender sensitive way, meaning they are addressed to women as well as men scientists. In terms of real impact, they will make the situation easier mostly for young scientist-mothers. Clearly, this is a very promising beginning; however, there are also other disadvantaged groups. Measures that would support mothers and parents (again, probably most likely scientist-mothers, but now without any age limit) – such as interrupting and extending the grant implementation period, as well as a systematic solution of work-life balance issues – still remain unaddressed. It is also strange that GA CR explicitly discusses maternity and parental leave in postdoctoral projects and enables a similar extension from the end of doctoral studies; however, in the rules of doctoral projects there is still a fixed age limit of 30 years with a vaguely stated option for exemptions. Thus, according to these rules GA CR – although in an oblique way because the postdoctoral project does not necessarily presuppose participation in a doctoral project – dictates the age when a scientist should have a baby.

Compensatory/equalising measures for women scientists[13]

From the perspective of increasing the visibility of the work of women scientists and of motivating young women in science and research, there is one positive example: L'ORÉAL Czech Republic now awards a stipend to selected early-stage female researchers[14]. In co-operation with AS CR, L'ORÉAL awards women scientists with annual stipends in order to support the realisation of their scientific research in the field of life and/or material sciences. The research must be conducted in the Czech Republic; the applicants must also have at least a PhD or postdoctoral title and be younger than 35 years of age.

The aim of the L´OREAL stipend is to call attention to high quality work by early-stage female scientists, to motivate them to pursue their research activity further and also to highlight them as role models for everyone – particularly female students – considering a similar carrier. Thanks to the media coverage it receives, the scholarship helps significantly to de-stereotype the concept of science as a male discipline. On the other hand, the chosen style of promotion reproduces another stereotype, that of the well-established connection 'woman-beauty-cosmetics' by presenting the winners as beautiful people in white coats. This strategy is hardly surprising as L´OREAL is a commercial enterprise. Still, it is a unique activity. Furthermore, a new award aiming to make visible the work of women in science may be introduced. Based on a request from the Ministry of Education, Youth and Sports, the NCCWS is in the process of preparing documents for a prize for women in science for their contribution to the development of Czech science. The goal is to give homage to scientific work of women, including their contributions to developments in the field, pedagogical activities and tutoring diploma and dissertation theses. It is thus directed mostly at prominent and successful women scientists with a long history of research. The prize should be awarded on an annual basis, each year in a different discipline.

Another request introduced at the Conference was related to support for projects aimed at increasing the number of women and female students working in the technical and natural sciences. The National Programme for Research II (NPR II)[15] is a specific programme created by the Ministry of Education, Youth and Sports to support such projects. However, research and scientific institutions have shown almost no interest in receiving funding for these projects: there were only two projects submitted, and only one was funded[16]. The programmes announced in the NPR II framework take the form of recommendations, and the submitted projects must be implemented by research institutions or universities. The results of NPR II show that from the perspective of research, there are other more attractive topics for the target audience. It may be due to the lack of motivation on the part of the institutions to address the issue of equal opportunities but also due to low awareness. Another factor may be that these institutions secure funding from other sources, or are reluctant to cooperate with the commercial sphere. Answers to these questions will be explored in further research.

In terms of concrete steps undertaken by institutions, the attempt to increase the number of women in decision-making positions in universities and research and development institutions has still not received a response. In 2006, representatives of the institutions claimed to agree that the situation was unsatisfactory[17]; however, the attempt to find a solution of these problems has been postponed until later[18]. In their reactions in 2007, representatives of the institutions that were addressed refused to see the low percentage of women in leadership positions as a problem that needed to be addressed, much less addressed systematically![19] Getting women into power structures that were created, and have long been occupied, by men is an issue that will not be resolved in the short term; it presupposes that the political will exists among the men currently in power. However, the will is lacking, and any systematic solution to the low percentage of women in leadership positions in science and research is out of reach. The need for satisfactory participation in decision-making (and this is not limited to scientific and research institutions) stems from the basic principles of democracy, and thus in the long term this situation is unacceptable.

What is still unclear is whether the reason that institutions accepted the proposals related to maternity and/or parental leave was that because they were clearly articulated; in contrast, proposals that were less clear – such as promising greater participation of women in decision-making in science and research – have not been accepted and/or discussed. Another reason could be that while the recommendations emphasised the goals, they did not specify a concrete path for achieving them. On the other hand, it is exactly these institutions that should play an active role in drafting science policy, and not merely waiting for concrete formulations (which they can later easily ratify) to fall from the heavens. The attitude of the institutions may reflect a combination of an easy implementation not requiring any deeper changes, and the acceptance of a specific situation as problematic and undesirable.

Measures dealing with equalising the position of women in science still remain unacceptable to scientific and research institutions; however, it is impossible to achieve real equality of women and men in science without such measures. Some progress is obvious with respect to the measures regarding parenthood, as well as in the promotion of women scientists as role models. This, however, entails the symbolic appreciation of work already done and does not provide support for current work and the career development of other, equally talented women scientists. No effort has been made to challenge stereotypes and offer concrete support for women to advance to decision-making positions in science or to participate in technical fields. There are also no measures supporting women scientists in any phase of their scientific work. The monitoring we conducted also shows that apart from the conference recommendations, the institutions have not introduced any further measures to improve the situation of Czech women scientists. The only exception is the possibility of postponing the beginning of grant implementation in the case of junior grants at GA AS CR, and the award for women scientists currently being prepared.

REFLECTION OF PROPOSALS FOR GENDER EQUALITY POLICY IN SCIENCE

Besides the analysis of attitudes adopted by scientific and educational institutions, we need to take a critical stance towards the proposed measures themselves. Marcela Linková mentions the problematic dimension of representation (the NCCWS representing women in science) in her chapter; another aspect of this issue is also the process of building consensus over policy proposals and their formulation[20]. Though there is a need to attend to these questions seriously, a clear position is also necessary in order to negotiate with institutions and to push the debates forward. The question thus arises whether or not to insist – and how – on measures that are unacceptable at the moment as this may compromise the NCCWS's negotiating position[21]. Of course, the essential mission of the NCCWS is to support changes, not to simply wait until a desirable state materialises of its own accord and then comment on it. What is needed is sensitive negotiation.

The goal of the Conference was to support women in science, and the proposals that came out of the Conference were focused primarily on parenthood. Though aimed at parents, it is implicitly expected that these proposals will for the most part positively affect scientist-mothers. This implicit expectation further strengthens the stereotype that women are linked with motherhood and child-rearing. Fathers are somewhat left out; they are included in the group of parents in general, and therefore they have the possibility to be active in child rearing; however, they do not receive any support in this activity, which may be why they seldom take advantage of work-life balance measures aimed at parents. From the perspective of work-life balance, the goal is to eliminate some of the barriers facing parents, and specifically women. The result of implementing such measures is that scientist-mothers get a chance to enact a masculine-gendered scientific carrier and institutions do not have to adopt any systematic and deeper changes. Furthermore, it is necessary to add that these proposals were, and still are, the easiest ones to implement and that they are the result of discussions with women scientists and of their needs[22] as discussed at the Conference. The group of scientists-parents faces a range of other discriminatory and/or limiting rules that have not yet been taken into account, rules that still must be eliminated. There is today a strong ideologically-based economic appeal to increase (fully, if possible) 'human resources,' which is a more acceptable rhetoric to institutions than demands for a democratic framing of gender equality policies that includes groups other than parents.

The proposed measures presented to institutions link parenthood to a certain age category[23]. This does not take into account the real and ever-growing trend to postpone child-bearing. From the perspective of steps targeted at scientist-mothers and parents working in science, the older ones cannot enjoy the benefit of these measures because they fall out of the relevant age category (see the unacceptability of the possibility to interrupt or extend a grant).

At the same time, parenthood is a specific life-phase that is no longer so closely linked to age (progress in medicine, nutrition, the possbility of adoption etc.). In fact, the proposals copy and perpetuate the stereotype that people should form families when they are young. People who decide to become parents at a later age also need support – to say nothing of those with older children. These groups should not be left out.

The list of proposed measures was not – and could not be – exhaustive. They do not represent the only possible or appropriate type of solution. The Conference also introduced a variety of other topics that need to be addressed when trying to implement equality of genders in science (such as the gender pay gap, questions related to the evaluation of scientific excellence, support of scientist-parents etc.).

CONCLUSION

The implementation of equal opportunity policies in science is a process in which the Czech Republic has been involved from the start. Grant agencies received the proposals for measures fairly favourably. However, they, as well as other institutions, will have to face other challenges and explore other areas that have thus far been left out and that are not yet perceived as problematic. Institutions now pay more attention to the parenting duties of students and scientists; however, these do not end with maternity and/or parental leave. After this point, there is a deafening silence regarding the reconsideration of institutional organisational rules. There are many examples of work-life (parenting) balance, but not all of them are suitable for all sciences. A suitable proposal can be found if the will is there.

As mentioned above, age still plays an important role when pursuing one's scientific carrier. The situation has been changing slowly (see the effort to eliminate the age limit of 26 years of age, the effort to eliminate the age limit of 35 for doctoral grants). However, many age restrictions persist (30 years for doctoral teams at GA CR, 35 for co-ordination of junior grants, and 38 for their colleagues in teams at GA AV CR). Many potential applicants cannot participate in the competition for doctoral or junior grants because of such restrictions. Could not someone older be a co-ordinator of a junior and/or doctoral project? It seems that the reason for such restrictions has not so much to do with work experience and effort to become better; the reason seems to be just a biologically-based age determinant. Is this reasoning still legitimate? The current ideal of a scientific carrier presupposes a linear and uninterrupted path through one field of human activity. We can ask ourselves if this is a sustainable approach for the future. I don't think it is. I think that these criteria should be changed; I see no reason why the beginning of one's scientific career should be limited by age. This means a loss of talents, not only of those people who decide to pursue science at a later age, but also those who – for whatever reason, including parenting – leave science for a while. Instead of an age limit there could by a cap on individual support from these grant programmes, limited, for example, by the number of submitted projects, number of awarded grants or by the length of study in a specific field.

Specific support for women in science has to battle many problems. Institutions have reduced their support to a symbolic level, appreciating already completed work (e.g. prizes for scientific contributions). This measure is certainly very important in that it increases the visibility of women scientists and their achievements, and creates role models; however, equal attention should be devoted to supporting women scientists currently engaged in their work and career development. The commercial sector could play a role in this. In terms of other potential changes, it is necessary to continue to examine not only the stage of implementation of gender equality policies in science, but also the actual proposals and their potential negative or side effects. The question of new accents, re-articulations and/or new proposals must always remain open. The NCCWS will try to obtain further information about the development of measures supporting equality in science and initiate a meeting with representatives of relevant institutions and scientists. Hopefully these continued efforts will make a mark.

BIBLIOGRAPHY

Bobek, M., Boučková, P., Kühn, Z. (eds.). 2007. *Rovnost a diskriminace*. C. H. Beck: Prague, pp. 20.

GA AV ČR: *Grantový řád.* Available at: http://www.gaav.cz/granty_typy.php.

GA ČR: *Zadávací dokumentace pro veřejné soutěže vyhlášené v roce 2007.* Available at http://pala.gacr.cas.cz/wordpress/?cat=6.

Kraťová, D., Motyková, J. 2007. "Statistical review: women in tertiary education in the Czech Republic". Pp. 34–39 in: *Trans/formations: gender, science and society*. In: Linková, M. (ed.). SOÚ AV ČR: Prague.

Linková, M. 2007. "Women in science after 1989: Czech activism and European debates ". Pp. 26-30 in: *Trans/formations: gender, science and society*. In: Linková, M. (ed.). SOÚ AV ČR: Prague.

Nussbaum, M. C. 2000. *Women and Human Development. The Capabilities Approach.* Cambridge University Press.

Ministry of Education, Youth and Sports: *National Research Programme.* Available at: http://www.msmt.cz/vyzkum/narodni-program-vyzkumu-npv-ii.

NCCWS: *Proposal of measures suggested by the conference Paths through the Labyrinth: why there are still so few women in science.* Available at: http://www.cec-wys.org/prilohy/c22b9569/opatreni_final.pdf.

Minutes from the Meeting of the Council of Higher Education Institutions dated 22 February 2007. Available at: http://www.radavs.cz/prilohy/4szazn.doc

Smetáčková, I., Linková, M. 2004. "Rovnost žen a mužů v rezortu MŠMT včetně problematiky vědy a výzkumu". Pp. 81–99 in: *Stínová zpráva v oblasti rovného zacházení a rovných příležitostí žen a mužů*. Pavlík, P. (ed.). Gender Studies: Prague.

Smetáčková, I., Linková, M. 2006. "Rovnost žen a mužů v rezortu MŠMT včetně problematiky vědy a výzkumu". Pp. 110–123 in: *Stínová zpráva v oblasti rovného zacházení a rovných příležitostí žen a mužů*. Pavlík, P. (ed.). Open Society Fund Prague.

Stöckelová, T., Linková, M. 2007. "Statistical review: research and development funding and women in the Academy of Sciences CR". Pp. 40–45 in: *Trans/formations: gender, science and society*. Linková, M. (ed.). SOÚ AV ČR: Prague.

Tenglerová, H. 2007. "Aktéři vědní politiky a jejich postoj k závěrům a doporučením vzešlým z konference „Cesty labyrintem: Proč je stále tak málo žen ve vědě". Pp. 26–41 in: *Cesty labyrintem: Propojování a oddělování soukromého a pracovního života*. Šaldová, K. (ed.). SOÚ AV ČR: Prague.

Written reaction of Prof. RNDr. Václav Pačes, DrSc., President of AV CR, to the proposal of measures suggested by the Conference *Paths through Labyrinth: why there are still so few women in science,* 27. 1. 2006.

Written reaction of Prof. MUDr. Josef Syka, DrSc., Director of GA CR, to the second round of monitoring of the implementation of proposals suggested by the Conference *Paths through Labyrinth: why there are still so few women in science,* 13. 8. 2007.

Written reaction of Prof. MUDr. Josef Syka, DrSc., the President of the GA CR, the proposal of measures suggested by the Conference *Paths through Labyrinth: why there are still so few women in science*, 21. 2. 2006.

Written reaction of Ing. Jitka Moravcová, CSc, Vice-dean for Science and Research at VSCHT, to the proposals suggested by the Conference *Paths through Labyrinth: why there are still so few women in science,* 4. 5. 2006.

Endnotes

1 I understand equal opportunities for women and men as an absence of barriers and 'a door open' to awareness (I am aware of the simplification in using these categories). The way to achieve equal opportunities is through eliminating these barriers, and also through targeted support and empowerment of disadvantaged groups and through an effort to change cultural values as well as to minimise social and institutional pressures on people based on their gender so that differences can be accepted.

2 The proposals are based on the recommendations of the Conference Paths through Labyrinth: why there are still so few women in science and can be found at http://www.cec- wys.org/prilohy/c22b9569/opatreni_final.pdf, website visited 16. 8. 2007.

3 Council for Research and Development (CRD), Ministry of Education, Youth and Sports (MEYS), Academy of Sciences of the Czech Republic (AS CR), Czech Research Council (the Czech title is Grant Agency of the Czech Republic, GA CR) and universities and colleges.

4 Institutions with these measures in their doctoral rules include, for example, the Masaryk University Czech Republic, Institute of Chemical Technology Prague, Police Academy of the Czech Republic and the Janáček Academy of Music and Performing Arts.

5 See the minutes from the meeting of the Universities Council held on 22. February 2007. Available at http://www.radavs.cz/prilohy/4szazn.doc, website visited 25. 7. 2007.

6 See the minutes from the meeting of the Universities Council held on 22. February 2007. Available at http://www.radavs.cz/prilohy/4szazn.doc, website visited 25. 7. 2007.

7 The Rules of grant applications of GA AS CR can be found at: http://www.gaav.cz/granty_typy.php.

8 Documentation for a public competition announced in 2007. Available at http://pala.gacr.cas.cz/wordpress/?cat=6, website visited 8. 8. 2007.

9 Ibid.

10 Written reaction of Prof. MUDr. Josef Syka, DrSc., Director of GA CR, to the second round of monitoring of the implementation of proposals suggested by the Conference Paths through Labyrinth: why there are still so few women in science, 13. 8. 2007.

11 Written reaction of Prof. RNDr. Václav Pačes, DrSc., President of AV CR, to the second round of monitoring of the implementation of proposals suggested by the Conference Paths through Labyrinth: why there are still so few women in science, 27. 1. 2006.

12 Resolution of the Academy Council of the AS CR. See http://www.avcr.cz/int/vestniky.html#Rok%202006, website visited 17. 8. 2007. The Scientific Council discussed the situation of women in science at the beginning of 2007 (see http://www.avcr.cz/ostatni.php?m=3&ID=344). However, no concrete information has been made available.

13 A compensatory measure is an activity to the benefit of a currently disadvantaged group of people (see Bobek, Boučková, Kühn 2007).

14 Website of L'ORÉAL Czech Republic stipend for women in science, http://www.prozenyvevede.cz/zadosti-o-stipendium.php, website visited 16. 8. 2007.

15 Ministry of Education, Youth and Sports: National Programme for Research and Development, available at: http://www.msmt.cz/vyzkum/narodni-program-vyzkumu-npv-ii.

16 The concrete projects were: 'Increasing the integration of young scientists, mostly women, in research in the field of a complex safe environment', VŠB – Technical University Ostrava, and a research project entitled 'Creating equal opportunities in order to increase the number of women in doctoral programmes in technical fields,' ČVUT Prague. The project has received funding, see result of the NPV II, specifically the table of results 2 E. Available at http://www.msmt.cz/vyzkum/narodni-program-vyzkumu-npv-ii-programy-2b-2c-2d-2e, website visited 16. 8. 2007.

17 Written reaction of Ing. Jitka Moravcová, CSc, Vice-dean for Science and Research at VSCHT, to the proposals suggested by the Conference Paths through Labyrinth: why there are still so few women in science, 4. 5. 2006.

18 Written reaction of Prof. RNDr. Václav Pačes, President of AS CR., to the proposals suggested by the Conference Paths through Labyrinth: why there are still so few women in science, 27. 1. 2006.

19 Written reaction of Prof. MUDr. Josef Syka, DrSc., President of GA CR to the second round of monitoring of the implementation of proposals suggested by the Conference Paths through Labyrinth: why there are still so few women in science, 13. 8. 2007 and written reaction of Prof. RNDr. Václav Pačes, DrSc., President of AS CR, to the second round of monitoring of the implementation of proposals suggested by the Conference Paths through Labyrinth: why there are still so few women in science, 10. 8. 2007.

20 I did not participate in the conference Paths through Labyrinth: why there are still so few women in science personally and therefore I cannot pursue this line any further. However, I think it is very important to discuss this for NCCWS's future work. Questions such as who spoke and who was and who was not heard, why or how the concrete proposals were created etc., remained unanswered. For the issue of consensus and different negotiating positions based on power, see, for example, Nussbaum 2000.

21 For example, the abovementioned compensatory measure for women in decision-making positions or a compensatory measure for active fathers who take care of babies.

22 I am aware of my simplification.

23 See Parenthood in tertiary education and grant systems.

Statistical Review: Women in Tertiary Education

Drahomíra Kraťková and Jana Motyková

OVERVIEW OF CHANGES IN HIGHER EDUCATION IN THE CZECH REPUBLIC AFTER 1989

The system of Czech higher education was shaped and internally developed under independent Czechoslovakia. In 1936, 24,810 students in the Czech lands were enrolled in 12 higher education institutions with 49 faculties, which employed 1469 professors and 2052 other pedagogical staff (Šebková, Závada 1998). The development of higher education in the years that followed was dramatically affected by the German occupation, but yet within the first days after the war the universities had started to rejuvenate. The 1948 change of political regime put a quick stop to this process. In 1950 a new higher education act came into force which eliminated the corporativist aspects and autonomy from Czechoslovak tertiary education that has been introduced in the second half of the 19th century and subjected all higher education institutions to state control and supervision. This legal form set the basic shape of Czech higher education until 1990. At the same time, state and political bodies started issuing various concept papers with the goal of changing the organisation of Czechoslovak universities. For example, the establishment of independent medical schools was considered. In 1953, pedagogical faculties were disbanded and replaced with independent tertiary and post-secondary pedagogical schools. The newly established network of post-secondary pedagogical schools copied the previous distribution of pedagogical faculties. The post-secondary pedagogical schools educated the teachers who taught ninth to eleventh grade in 11-year secondary schools and the teachers for pedagogical and specialised schools. The 1966 University Act partially renewed academic rights and traditions. The subsequent normalisation policies were further consecrated by the 1980 Act on Higher Education Institutions which renewed direct central control, and higher education institutions were again divested of self-administration (Šebková, Závada 1998).

The quantitative increase in higher education was the result of the sweeping political changes that occurred after 1989. The academic community as a whole, the body of teachers and students, was the most active segment of the population. The quick attention given to the adoption of new higher education legislation attests to the importance ascribed to the academic community (Šebková, Závada 1998). The post-1989 development of higher education institutions was characterised by radical changes in the personnel in leadership positions, the expansion of academic freedoms, focus on student and pedagogical staff mobility and changes in the goals and content of education. The number of students and faculties grew significantly, especially schools of economics (Malach 1999). As can be seen in Table 1, the number of faculties increased dramatically as a result of the restructuring of higher education institutions.

Table 1: Increase in the number of higher education institutions and faculties between 1989 and 2006.
(VŠ = higher education institutions; V = public HEI; ST = state HEI; S = private HEI)

Year	**1989***	**1990***	**1991***	**1992***	**1993***	**1994***	**1995***	**1996***	**1997***
VŠ **V/ST/S**	23	24	23	23	23	23	23	23	23
faculties V/ST	73	82	94	99	105	107	110	111	112
Year	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
VŠ **V/ST/S**	27 23/4/0	27 23/4/0	35 23/4/8	45 24/4/17	55 24/4/27	56 24/4/28	63 25/2/36	64 25/2/39	69 26/2/41
faculties V/ST	118 113/5	115 110/5	116 111/5	118 113/5	122 117/5	119 117/2	120 117/3	123 120/3	130 127/3

* data does not include state higher education institutions

Source: statistical information of ÚIV

Higher professional schools were introduced into the Czech educational system in 1991 as a new type of institution positioned between secondary and university higher education. Initially they were opened as an experiment and had a limited number of students. Between 1995 and 1996, the number of higher professional schools increased from 25 to 158 because the establishment of these schools was legislatively easier. The number of students entering higher education soon exceeded the number of students of the post-secondary programmes. Higher professional schools are today a recognised segment of non-university type tertiary education (Čerych 1997); nevertheless, their position in the system is not ideal because they are bound by norms that are tailored to the character of secondary education. Most higher professional schools have been established together with secondary schools. Less than one quarter of these institutions exist independently. It is clear that the reduction in the surplus of applications in universities, including the growing number of bachelor level study programmes, has put a stop to the growth in the number of students in higher professional schools. The first reduction in the number of newly enrolled students came in 2004 when there was a significant drop in interest in this type of study (see Table 2).

Table 2: Study in higher professional schools of non-university type between 1992/93 and 2005/06.

Year		2 1 13/31	21 19/94	20 94/95	20 25/32	20 56/97	20 37/98	20 2/11
Total no. of students		1,391	2,438	4,631	6,302	14,931	23,526	29,566
Of which	Initial	1,271	2,161	4,334	6,095	13,294	21,429	26,827
	On job	120	277	299	207	1,637	2,097	2,739
Year		5/101	2000/01*	1000 1/2	667 1/3	500 3/4	400 4/5	334 1/6
Total no. of students		31,073	26,605	26,680	27,584	30,622	29,674	28,792
Of which	Initial	27,930	22,691	22,559	22,858	25,550	25,033	23,881
	On job	3,143	3,914	4,121	4,726	5,072	4,641	4,911

* Decrease in the number of students is due to the small number of graduates of secondary education with diploma as a result of the fact that elementary education was extended by one year, from having eight grades to nine grades.

Source: Statistical information of the Institute for Information on Education; sex-disaggregated data on students of post-secondary specialised schools is not available.

A consequence of the changes in the Czech higher education system was a change in the structure of students in universities: in 2000, 202,000 students were enrolled in universities, of whom 18.7 % were enrolled in bachelor's degree programmes, 5.8 % in follow-up master's degree programmes, and 67.3 % and 8.2 % in master's and doctoral programmes, respectively. In 2005, the number of students increased to 298,000, of whom 52.5 % were enrolled in bachelor's degree programmes, 8.1 % in follow-up master's degree programmes, 31.7 % in master's degree programmes and 7.7 % in doctoral programmes. This represents a 42 % increase in the number of students and attests to the successful restructuring of higher education (2005 Annual Report on Activities of Higher Education Institutions).

The percentage of people with higher education is an important factor in the functioning of every mature and modern society and its economy. However, the percentage of students enrolled in higher education is but one of many such important factors and we can easily find countries where the number of higher education students is not high but which are still doing well in international comparisons (for example, Luxembourg and Austria in Europe). We can also find countries with a high number of university students but which do not compare so well (Spain or the Baltic states, for example). The number of higher education students in the Czech Republic is still low compared to other developed countries despite the expansion of the Czech higher education witnessed in the last fifteen years. Recent OECD data on the Czech Republic informs that in 2004, among those between the ages of 25 and 64, slightly over 12 % had tertiary education; in the EU the average is almost double this. The situation is changing quickly, though. In the last few years the Czech Republic has been among those countries with the fastest growing number of graduates in higher education. Between 2002 and 2004 the number increased by a third; in the EU only Italy and Estonia have seen a similar increase. Today fresh higher education graduates make up over a quarter of the relevant age category. Moreover, the increase has been even faster in the last few years. While in 2001 slightly under 40,000 applicants applied to universities in the CR (and over 50,000 to the entire tertiary education segment, including higher professional schools), in 2005 this number was 60,000 (and over 72,000 for the whole higher education sector). The growth in the number of newly enrolled students continues despite a smaller pool of potential students as a result of the decreasing size of the population (Koucký, Zelenka 2006) (see Table 3).

Table 3: HE students and graduates between 1989/90 and 2005/06.

	HE students			**HE graduates**		
Academic year	**Total no.**	**women**	**% of women**	**Total no.**	**women**	**% of women**
22 1/10	110,021	x	x	19,038	x	x
21 79/91	115,072	x	x	15,693	x	x
21 59/92	110,883	x	x	18,360	x	x
21 13/31	115,132	x	x	18,160	x	x
21 19/94	123,523	x	x	18,113	x	x
20 94/95	133,342	x	x	19,566	x	x
20 25/32	145,148	65,387	45.0	19,130	9,900	54.6
20 56/97	162,402	73,436	45.2	20,934	10,708	51.2
20 37/98	173,826	79,458	45.7	23,846	11,746	49.3
20 2/11	182,745	85,513	46.8	27,179	13,234	48.6
5/101	193,493	92,267	47.7	27,446	13,775	50.2
2000	201,818	99,900	49.5	29,651	15,198	51.3
1000 1/2	213,596	108,574	50.8	30,719	15,557	50.6
667 1/3	231,705	120,181	51.8	32,375	16,781	51.8

500 3/4	255,199	134,427	52.6	34,594	18,201	52.6
400 4/5	289,205	150,094	51.8	39,764	21,262	53.4
334 1/6	298,525	153,304	51.3	43,960	24,306	55.2

Source: ÚIV

The table shows that female students make up one half of all students; since the academic year 2001/02, it has been more than one half. Female higher education graduates also outnumber their male counterparts: in the academic year 2005/06, female graduates accounted for more than 55 % of the total number.

WOMEN IN LEADERSHIP POSITIONS IN HIGHER EDUCATION

The average full-time equivalent of pedagogical staff in higher education institutions in 2005 was 15,015.9, and of researchers it was 1,708.3. The available statistics show that women are most often found in the positions of lecturers and assistant professors (47 % and 41 %). However, only 20 % of associate professors and 7 % of full professors are women, although according to the statistics women comprise one third of the total number of research and pedagogical staff. The following basic rule is applicable to higher education institutions: the number of female staff members falls as one ascends the higher education hierarchy moving up the ladder of academic titles and the related scientific titles (Matějů, Vitásková 2006).

The situation is similar in the leadership positions in higher education institutions. According to a statistical survey carried out by the Centre for Higher Education Studies in 2003, of the total number of 727 academic dignitaries (rector, deputy rector, dean, deputy dean), 137 (18.8 %) were women:

- of 58 rectors, nine were women (15.5 %)
- of 129 deputy rectors, 27 were women (21 %)
- of 118 deans, six were women (5.1 %)
- of 422 deputy deans, 95 were women (22.5 %)

In higher education, women make up one third of R&D staff but the percentage of women in decision-making positions does not even reach one third on average. Does this mean that higher education institutions do not have a sufficient number of excellent and qualified women available who could hold such top positions, or are there not women interested in holding these positions? Or does this situation reflect the organisation of academic institutions, invisible barriers which prevent women from advancing their careers and achieving leadership positions, the 'glass ceiling' beyond which women cannot pass?

The area of education, including the allocation of funds for higher education institutions, falls within the remit of the Ministry of Education, Youth and Sports. Although female members of staff in education outnumber men, the Ministry uses the same model of management as used in other spheres: the higher we go in the hierarchy, the lower the percentage of women. Until 2002, the Czech Republic did not have a single female minister of education even though education is considered to be an area closer to women.

WOMEN IN RESEARCH AND DEVELOPMENT IN HIGHER EDUCATION

Since the beginning, science has been defined as a masculine project and has been masculinised despite the fact that women started to enter its different fields in the 20th century, managing to build a strong position. The structuring of research and scientific knowledge, the allocation of funds for R&D, scientific language and other aspects mirror and further promote the current unequal gender order. Women are concentrated in fields such as social sciences, pedagogy, medicine and biology, and the pay distribution corresponds to this segregation. Fields where we find more women are considered to be less valuable or less demanding than those where men predominate. Fields with a lower number of women and which are strongly theoretical (such as theoretical physics) have a high status (see Table 4).

Table 4: R&D employees[1] in the Czech Republic.

Disciplines	**2000 total**	**2000 of whom women**	**2003 total**	**2003 of whom women**	**2004 total**	**2004 of whom women**	**2005 total**	**2005 of whom women**
Natural sciences	13,905	5,521	11,715	4,371	7,719	2,679	11,163	4,067
Technical sciences	25,224	6,422	25,342	5,782	13,947	2,586	20,570	4,107
Medical sciences	5,626	2,887	6,791	3,559	2,132	1,186	3,800	2,119
Agricultural sciences	3,419	1,740	3,752	1,917	1,796	852	2,505	1,295
Social sciences and humanities	5,332	2,752	8,099	3,950	3,171	1,505	5,333	2,548
Total	**53,506**	**19,322**	**55,699**	**19,579**	**28,765**	**8,808**	**43,370**	**14,135**

Source: Czech Statistics Office. Ukazatele výzkumu a vývoje 2005.

Table 4 makes it clear that women constitute 32.6 % (as of 31 December 2005) of the employees in research and development. Women are most often found in medical sciences (55.8 %) and in social sciences and humanities (47.8 %), and are found least often in technical sciences (19.9 %).

RESEARCH AND DEVELOPMENT FUNDING IN HIGHER EDUCATION INSTITUTIONS

The allocation of funds for research and development is decided by grant agencies, and to a large extent these agencies decide on the direction that science and research takes in the CR. Grant agencies do not provide data segregated by sex, nor do they keep publicly-available statistics on the primary investigators of projects. The data provided below was collected and calculated based on data contained on the websites of the grant agencies.

Grant Agency of the Academy of Sciences of the CR (GA AS, Grantová agentura Akademie věd České republiky /GA AV)

The Grant Agency of the Academy of Sciences of the CR is composed of the leadership of the GA AS, the Presidium, the Supervisory Board, Discipline Committees and the secretariat. The leadership consists of the Presidium and chairpersons of the Discipline Committees. The leadership makes decisions on the awarding of grants. The Presidium is made up of a chairman and three deputy chairmen (in 2006, all four were men). The percentage of women in the Discipline Committees differs significantly according to the discipline, as can be seen in Table 5.

Table 5: Women in Discipline Committees of the Grant Agency of the Academy of Sciences.

Non-life science discipline committee	No. of members	Of whom women	% of women
Mathematical and physical sciences and information science	15	1	6.6
Technical sciences and cybernetics	15	0	0.0
Earth sciences and astronomy	15	2	13.3
Life and chemical sciences discipline committee			
Chemical sciences	15	3	20.0
Medical and molecular biological sciences	15	5	33.3
Ecology-biological sciences	15	3	20.0
Humanities and social science discipline committee			
Social and economic sciences	12	3	25.0
Historical sciences	12	4	33.3
Humanities and philological sciences	12	4	33.3

Source: GA AS.

Women make up one third of the members of the discipline committees of the medical sciences, and molecular-biology, historical sciences, humanities and philological sciences. The number of women is smallest in the discipline committees in non-life sciences – there is not a single woman in the technical sciences!

The activities of the GA AS are controlled by the Supervisory Board of the GA AS and other bodies such as the Council for Research and Development. The Supervisory Board consists of the chairman and nine members (in 2006 there was one woman on the Supervisory Board). The number of grants awarded by the GA AS to higher education institutions differs according to the sex of the primary investigator. Of the 141 grants awarded in 2004, only 28 of the primary investigators (or 20 %) were women.

Czech Science Foundation (CSF, Grantová agentura České republiky / GAČR)

The Czech Science Foundation consists of the Presidium and the Supervisory Board. Externally the CSF is represented by the President. The executive body is a five-member Presidium (five men in 2006). The Discipline Committees are an advisory body for the assessment of proposals of grant projects. It is heart-warming that of the five chairpersons of the discipline committees, three are women (chairwomen of the discipline committees of technical sciences, natural sciences and medical sciences, see Table 6).

Table 6: Women in Discipline Committees of the Czech Sciences Foundation

Discipline Committees	No. of member	Of whom women	% of women
Technical sciences	25	4	16.0
Natural sciences	25	4	16.0
Medical sciences	17	6	35.2
Social sciences	25	9	36.0
Agricultural sciences	18	4	22.2

Source: CSF.

Women are most represented in the discipline committees of social and medical sciences. The situation is the same when looking at women's representation in discipline subcommittees – of the 457 members of these subcommittees, 86 (or 18.8 %) are women. Again, women are most represented in the discipline subcommittees of medical sciences (30.1 %) and social sciences (25.9 %).

Out of the total number of 366 grants awarded in 2005 to higher education institutions, 71 were awarded to female primary investigators (or 19.3 %) (see Table 7).

Table 7: Distribution of grants awarded by the Grant Agency of the Czech Republic, by discipline

	2004			2005		
	No.	Of which women	%	No.	Of which women	%
Technical	83	6	7.2	85	6	7.0
Natural	63	8	12.7	62	12	19.3
Medical	12	3	25.0	11	2	18.2
Agricultural	7	2	28.6	9	4	44.4
Social	95	33	34.7	108	28	25.9
Postdoctoral	56	13	23.2	73	16	21.9
Doctoral				18	3	16.7
Total	**316**	**65**	**20.6**	**366**	**71**	**19.4**

Source: Czech Science Foundation.

Council of Higher Education Institutions of the Czech Republic (CHEI, Rada vysokých škol / RVŠ)
The Council of Higher Education Institutions of the Czech Republic is a representative body of higher education institutions. The general remit of the CHEI is defined as dealing with the development, financial security, legal regulations, activities, organisation and management of higher education institutions and principal matters concerning development, functioning and the interests of higher education institutions and their academic staff members, students and employees. It issues position papers and recommendations to the Ministry of Education, Youth and Sports, and to other bodies. The Council is headed by the Presidium of CHEI. The CHEI has 48 members, of whom five are women.

Higher Education Developmental Fund (HEDF, Fond rozvoje vysokých škol / FRVŠ) organises annual tenders for projects with the aim of creating appropriate conditions for educational activities and influencing the quality of pedagogical activity and the quality of studies. The HEDF is headed by an 11-member board (there are two women on it); the HEDF Supervisory Board has three members, one of whom is a woman. An overview of the grants awarded to universities in 2004 and 2005 is given in Table 8.

Table 8: Grants subsidised by the Higher Education Development Fund, by discipline

discipline	No. in 2004	2004 Of which women	% of women	No. in 2005	2005 Of which women	% of women
technical	337	46	13.6	367	37	10.1
natural	257	93	36.1	281	98	34.8
medical	142	71	50.0	107	47	43.9
agricultural	135	48	35.5	99	27	27.3
social	242	95	39.2	252	112	44.4
Total	**1,113**	**353**	**31.7**	**1,106**	**321**	**29.0**

Source: Council of Higher Education Institutions of the Czech Republic; the table provides total numbers of grants awarded and the total number of grants with female primary investigators.

Female primary investigators can be found most often in medical and social science disciplines. This corresponds to the higher number of female academicians working in these disciplines in universities in general.

CONCLUSION
Female university graduates outnumber male university graduates. These numbers, however, are not mirrored in the higher education research sector – among the pedagogical staff at universities only one third are women, and in leadership positions women occupy less than one fifth of the positions. The situation is similar in research and development – only 20–30 % of primary investigators are women.

When we realise that the equality of women and men is a basic principle of the European Union established in the Treaty Establishing the European Community and in other legal and programme documents of the European

Union, a brief glance at the facts mentioned above makes it clear that not everything is all right. If it were, Czech and foreign authors dealing with the representation of women in universities and research and development would not be writing in specialised publications about the 'glass ceiling' (through which women cannot move up) or the 'leaky pipeline' (through which women leak out of science).

BIBLIOGRAPHY

Čerych, L. 1997. "Diverzifikace terciárního vzdělávání v České republice". *AULA*, Vol. 5, No. 4, pp. 58–66.

Koucký, J., Zelenka, M. 2006. *Postavení vysokoškoláků a uplatnění absolventů vysokých škol na pracovním trhu 2006*. Praha: SVP PF UK.

Available at: (http://svp.pedf.cuni.cz/uploads/media/nezamestnani_vysokoskolaci.pdf)

Kraťková, D., Motyková, J. and J. Baštová. 2006. "Rovné příležitosti žen a mužů ve výuce a vědě na vysokých školách a vyšších odborných školách v České republice". *AULA*, Vol. 14, No. 4, pp. 4-21.

Kraťková, D. 2006. "Rovné příležitosti žen a mužů ve výzkumu a vývoji na vysokých školách v České republice". *AULA,* Vol. 14, No. 1, pp. 9-24.

Malach, A. 1999. "Ke kvantitativnímu a strukturálnímu vývoji studentů vysokých škol v ČR". *AULA*, Vol. 7, No. 1, pp. 17–23.

Matějů, P., Vitásková,A. 2006. "Vybrané výsledky výzkumu akademických pracovníků veřejných vysokých škol". In: *České vysoké školství na křižovatce 2*. Praha: Stratif.

Šebková, H., Závada, J. 1998. "České vysoké školství 1918–1998". *AULA*, Vol. 6, No. 4, pp. 68–78.

INFORMATION SOURCES

Website of the Ministry of Education, Youth and Sports, Institute for Information on Education, Council of Higher Education Institutions of the Czech Republic, Higher Education Developmental Fund, the National Institute of Technical and Vocational Education, Grant Agency of the Czech Republic, and the Grant Agency of the Academy of Sciences of the CR.

Endnotes

1 R&D employees include people working in these positions: researcher, technician and equivalent staff, other supporting staff.

Statistical Review: Research and Development Funding and Women in the Academy of Sciences of the CR

Tereza Stöckelová and Marcela Linková

The objective of this statistical review is to provide basic information about research and development (R&D) in the Czech Republic in recent years (Section 1), focusing specifically on women in science (Sections 2 and 3).

Sections 1 and 2 draw on information published in *Research and Development Indicators (Ukazatele výzkumu a vývoje)*, an annual publication by the Czech Statistical Office.[1] *Research and Development Indicators* are organised according to the Frascati manual, an OECD international handbook created for R&D statistics. In Sections 1 and 2 we worked with data for 2000 and 2005; this decision was the result of there being sex-disaggregated data available for these years. The year 2000 was the first year that the Czech Statistical Office published sex-disaggregated statistics in *full time equivalents*[2], which is a measure used in the statistics in this review. (Sex-disaggregated *head count* statistics have been monitored since 1999.) The year 2005 is the last year for which the *Research and Development Indicators* publication is available.

The data in Section 3 was collected by the team, mostly from internet websites of individual institutions and through direct queries to these institutions when the data they provided on their websites was not complete. The data captures the situation at the beginning of 2006.

CONTEXT: PROPORTIONS AND DISPROPORTIONS OF RESEARCH AND DEVELOPMENT IN THE CR

Total R&D expenditures are one of the key R&D indicators. In 2005, R&D expenditures in the Czech Republic totalled more than CZK 42 billion, equalling 1.5 % GDP. Let us note that according to the Lisbon strategy, EU member states should spend at least 3 % of GDP on R&D by 2010, of which at least 1 % should come from public budgets.

Let us have a look at the distribution of R&D expenditures by sector.

Table 1.1: R&D expenditures between 2000 and 2005 according to sector (in billion CZK and percentage).

	expenditures in 2000	% of expenditures in 2000	expenditures in 2005	% of expenditures in 2005	increase between 2000 and 2005
business	17,052	60.2	27,209	64.5	10,157
governmental	6,714	23.7	7,889	18.7	1,175
higher education	4,437	15.7	6,907	16.4	2,470
non-profit	134	0.5	194	0.5	60
total	**28,337**	**100.0**	**42,198**	**100.0**	**13,861**

We can see from Table 1.1 that though the total volume of funding increased between 2000 and 2005 by CZK 14 billion (approximately 49 %), the distribution of the expenditures over sectors remained almost constant. From this perspective, the business sector appears to be the strongest, accounting for almost 65 % of the total R&D expenditure; funding for the non-profit sector was almost negligible (0.5 %). At 65 %, the share of the business sector is at the EU-25 average level (63 %). The Czech business sector is also the sector that contributes the most to funding R&D – in 2005 CZK 22.82 billion came to R&D from the business sector, while the contribution from the public budgets was CZK 17.2 billion (cf. *Ukazatele výzkumu a vývoje 2005*). State budget expenditures equalling CZK 22.9 billion are planned for 2008 (resolution of the government dated 23 May 2007 No. 564).

Another relevant division of expenditures is the division according to discipline (see Table 1.2).

Table 1.2: R&D expenditures by discipline (in billion CZK and as %)

Discipline	2000 expenditures	% of 2000 expenditures	2004 expenditures	% of 2004 expenditures	2005 expenditures	% of 2005 expenditures	Increase between 2000/04
natural	6,551	23.1	8,777	25.0	9,845	23.3	2,225,979
technical	17,037	60.1	19,632	56.0	24,566	58.2	2,595,381
medical	1,789	6.3	2,940	8.4	3,374	8.0	1,151,177
agricultural	1,399	4.9	1,692	4.8	1,757	4.2	292 ,37
social	566	2.0	995	2.8	1,457	3.5	428,837
humanities	995	3.5	1,047	3.0	1,199	2.8	52,234
total	**28,337**	**100.0**	**35,083**	**100.0**	**42,198**	**100**	**6,746,046**

In keeping with the centre of R&D occupied by the business sector, technical sciences predominate financially among the scientific disciplines (60.1 and. 58.2 %). On the opposite pole of this axis we find the social sciences and humanities, which together receive around 6 % of the total expenditures.

Between 2000 and 2005 we can see more dynamic shifts in the allocation of expenditures across disciplines than across sectors. The percentage going to technical sciences fell slightly, while there was a considerable increase in expenditures for the medical sciences, and to some extent also the natural sciences as well. In 2005 the investment into social sciences exceeded 3 %, and in absolute terms the expenditures almost tripled and surpassed expenditures into humanities.

The two strongest and financially prioritised R&D arenas in the Czech Republic are the business sector and the technical sciences. The arenas characterised by the lowest expenditures are the non-profit sector and the social sciences and humanities.

WOMEN IN RESEARCH AND DEVELOPMENT

Women in R&D made up 33.2 % of employees in 2000 and 32.6 % of employees in 2005. The percentage differs significantly according to the type of position. As shown in Table 2.1, women in R&D are found mostly in technical staff and other jobs.

Table 2.1: R&D employees according to type of employment

	2000			2004			2005		
	total	of which women	% of women	total	of which women	% of women	total	of which women	% of women
researchers	13,852	3,551	25.6	1,300	4,052	24.9	24,169	6,349	26.27
technical staff	7,319	3,038	41.5	9,446	3,407	36.0	13,773	5,153	37.4
others	3,027	1,447	47.8	3,020	1,348	44.7	5,429	2,633	48.5
total	**24,198**	**8,036**	**33.2**	**28,765**	**8,808**	**30.6**	**43,370**	**14,135**	**32.6**

Approximately one third of the people employed in R&D are women. More than one half of them work in non-research jobs – of the women working in R&D, 44.1 % of the women in 2000 and 44.9 % of the women in 2005 worked as researchers. If we look at the statistics for men, the percentage of men employed in R&D that worked as researchers was 63.7 % in 2000 and 61 % in 2005. In the following section we will concentrate only on women occupying research positions – a group comprising 14.6% (in 2000 and 2005) of all R&D employees (Table 2.2).

Table 2.2: Employees in the position of researcher, by sector

	2000			2004			2005		
	total	of which women	% of women	total	of which women	% of women	total	of which women	% of women
business	5,533	908	16.4	7,297	1,116	15.3	10,353	1,656	15.9
governmental	4,424	1,398	31.6	4,661	1,591	34.1	6,113	2,135	34.9
higher education	3,768	1,220	32.4	4,274	1,324	31.0	7,575	2,483	32.8
non-profit	127	25	19.7	67	21	31.3	127	76	59.8
total	**13,852**	**3,551**	**25.6**	**16,300**	**4,052**	**24.9**	**24,169**	**6,349**	**26.3**

The data in Table 2.2 capturing the percentage of women by sector reveals several things. The relative percentage of women in the business sector has a tendency to remain significantly below the average, while in the governmental and higher education sectors, and especially in the non-profit sector, in 2005 it is (significantly) above the average.

Between 2000 and 2005 there was a large increase in the number of researchers in the business sector (87 % increase), but the increase was mostly accounted for by men. Conversely, the increase in the governmental sector, however, was the result of an increase in the number of women researchers (compared to 2004, 81.4% of the increase was through the addition of women researchers; compared to 2005, 43.6 % of the increased was through the addition of women researchers).

Table 2.3: R&D employees in a research position, by discipline

	2000			2004			2005		
discipline	total	of which women	% of women	total	of which women	% of women	total	of which women	% of women
natural	4,429	1,288	29.1	4,822	1,252	26.0	6,483	1,714	23.9
technical	6,202	895	14.4	7,083	980	13.8	10,178	1,427	14
medical	909	393	43.2	1,328	596	44.9	2,483	1,160	46.7
agricultural	929	400	43.1	935	358	38.3	1,462	583	39.9
social	311	120	38.6	1,115	453	40.6	1,929	803	41.6
humanities	1,072	455	42.4	1,017	413	40.6	1,634	662	40.5
total	**13,852**	**3,551**	**25.6**	**16,300**	**4,052**	**24.9**	**24,169**	**6,349**	**26.3**

Table 2.3 shows that there is an especially high percentage of women in the medical sciences, humanities, the social and the agricultural sciences, and low numbers of women in the technical sciences. In the natural sciences the relative share of women is slightly below the total average.

That the total relative percentage of women researchers is around 26 % is largely due to the fact that in 2000, 44.8 % (and 42.1 % in 2005) of all R&D researchers were employed in the technical sciences, where the percentage of women is lowest. Furthermore, Section 1 showed that the technical sciences and the business sector are the best funded areas for R&D activities.

In order to specify and calculate the last disparity, we shall use the *honeypot* indicator developed for the European Commission. This indicator captures the relationship between R&D expenditures, distribution of researchers over R&D sectors or disciplines and the percentage of women in these sectors or disciplines. The indicator expresses the ratio between the actual and expected expenditures *per capita* for women, and is calculated according to the following equation:

$$H = \frac{\{[\ (O \times Oi)\ ] - E \times Ep\ \} \times 100}{E \times Ep}$$

where
H = *honeypot* indicator
E = total R&D expenditures
Ep = total percentage of women researchers
O = total expenditures in each sector or discipline
Oi = percentage of women in each sector or discipline

The resulting figure is an indication of the percentage by which the actual *per capita* expenditures for women deviates from the figure that would be the case if women were equally distributed over sectors or disciplines with both low and high expenditures. According to the interpretation of European Commission experts, results of over 10% are considered to be an indicator of there being a significant advantage or disadvantage.[3]

The results of the calculations for the Czech Republic reveal that the percentage is over 10 % for both sectors and disciplines, confirming the initial insight from the overview in Table 2.4.

Table 2.4: Honey pot indicator for sectors and disciplines

Honey pot indicator	2000	2004
sectors	-12.13%	-12.88%
scientific disciplines	-12.17%	-10.66%

The indicator values show the percentage by which lower expenditures *per capita* are allocated to women because women are concentrated in sectors or disciplines that are not as well funded as others. This indicator, however, does not only capture the unequal distribution of funds over sectors or disciplines (among and within institutions). In the section that follows we will attempt to look into institutions. The statistics presented so far show that the position of women in science involves three disparities.

Firstly, women make up only approximately one third of R&D employees.
Secondly, of these women only about 45 % work in a research position; the others are employed as technical staff or 'other'. That means that women researchers make up only approximately 15 % of the total number of R&D employees.
Thirdly, women researchers are significantly more often employed in sectors and disciplines receiving less funding.

WOMEN IN DECISION-MAKING AND LEADERSHIP POSITIONS

Statistics in Section 3 show whether individual *positions* are occupied by a person of the male or female sex. We collected data from the internet websites of institutions between 3 and 7 February 2006. If the information was not available on the website, we requested by telephone that the information be sent to us electronically.

This review only concerns institutes of the Academy of Sciences. Originally, we intended to gather and publish similar data for universities, colleges and their faculties. However, in the course of collecting data we found that many personnel changes in leadership positions take place at the turn of the year. As for the business sector, the only data available is the data published in the *Research and Development Indicators*.

Let us first look at the composition of the leadership of the Academy of Sciences CR (Table 3.1).

Table 3.1: Leadership of the Academy of Sciences of the Czech Republic

	total	of which women	% of women
Academic Council*	17	0	0
Academic Assembly	237	28	118
Scientific Council	30	4	133

*includes also the President and Vice-Presidents of the Academy of Sciences CR.

We do not find a single woman at the absolute top of the Academy of Sciences, in the Academic Council. When we consider that in 2004 women made up 34.1 % of researchers in the governmental sector, we can see that women are also very poorly represented in the other two bodies of the Academy, the Academic Assembly (11.8 %) and the Scientific Council – not only with respect to their percentage in the population but also specifically in the R&D governmental sector.

Let us now look at the intermediary level between the leadership of the Academy of Sciences and research on the ground, a level represented by the leadership of the institutes at the Academy of Sciences (Tables 3.2, 3.3, and 3.4.).

Table 3.2: Institutes of the Academy of Sciences of the CR – non-life sciences

	total	of which women	% of women
Directors	18	0	0
Deputy directors	28	3	10.7
Scientific Councils	234	18	7.7

Note: complete.

Table 3.3: Institutes of the Academy of Sciences of the CR – life science and chemistry

	total	of which women	% of women
Directors	17	5	29.4
Deputy directors	25	5	20.0
Scientific Councils	222	41	18.5

Note: data for the Scientific Council of the Institute of Analytical Chemistry is not included.

Table 3.4: Institutes of the Academy of Sciences of the CR – humanities and social sciences

	total	of which women	% of women
Directors	17	4	23.5
Deputy directors	27	10	37.0
Scientific Councils	173	36	20.8

Note: data for the Scientific Council of the Institute of Psychology is not included; data includes the female director of the Historical Institute in Rome (a branch of the Historical Institute in Prague).

Data for the individual institutes of the Academy of Sciences of the CR show that the lower percentage of women in the technical and the natural sciences in general is also reflected in the low percentage of women in the leadership of these institutes. In disciplines where the percentage of women researchers is higher, the composition of the leadership of such institutes reflects this. With the exception of the position of Deputy Director in humanities and the social sciences, the percentage of women is always lower than the percentage of female researchers in the governmental sector (34.1%).

With respect to the Academy of Sciences of the CR, we can add another disparity to the three mentioned above: women are significantly less represented in decision-making and leadership positions – especially in the leadership of the Academy, but also in the leadership of individual institutes.

Endnotes

1 Ukazatele výzkumu a vývoje 2000-2001 [http://www.czso.cz/csu/edicniplan.nsf/publ/9601-02-2000_2001]; Ukazatele výzkumu a vývoje za rok 2004 [http://www.czso.cz/csu/edicniplan.nsf/publ/9601-05-za_rok_2004]

2 'The average registered number of employees in full time equivalent in research and development activities (hereinafter FTE): this indicator best captures the actual time spent on research and development activities by R&D employees. One FTE equals one year of full time work of an employee who works 100 % on R&D activities. For employees who do activities other than R&D, only the relevant portion of their work capacity shall be included, which will prevent the overestimation of data on the number of R&D employees. The FTE indicator includes the number of people working for reporting units based on agreements on work activities or agreements on performing work, calculated according to the methodology applicable for FTE.' (note: translated by Marcela Linkova), (http://www.czso.cz/csu/edicniplan.nsf/tab/AB00491932)

3 European Commission, Research Directorate-general, Directorate C - Science and Society, Women and Science. 2004. Subject: Explanation of the Honeypot Indicator – Discussion at the 7th meeting of the Statistical Correspondents of the Helsinki Group on Women and Science.

List of Contributors

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Jana Motyková joined the Centre for Higher Education Studies in 2004 as a researcher. She contributes to research projects and studies higher education and science policy. She is the executive editor of the *AULA* quarterly (review for higher education and science policy) where she has published on gender issues. As part of her work on the research plan *Tertiary Education in the Knowledge Society,* specifically the section *Quantitative Aspects of Systems, Developmental Trends,* she concentrates on the issue of equal opportunities for men and women in education, science and higher education management. She co-authored the publication *Rovné příležitosti žen a mužů ve výuce a vědě na vysokých školách a vyšších odborných školách v České republice (*Equal Opportunities for Women and Men in Teaching and Research in Universities and Higher Specialised Schools in the Czech Republic*),* published by the Centre for Higher Education Studies in 2006.

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WOMEN IN SCIENCE: OVERVIEW OF HUNGARY

Mária Palasik and Eszter Papp

Introduction

In Hungary, universities have been operating with shorter or longer interruptions since the 14th century, but women were allowed to obtain university degrees only a little over a hundred years ago. They have, however, succeeded in counter-balancing the cultural handicap deriving from the above situation during the recent decades, insomuch that since the late 1990s more women have been studying in higher education institutions than men. This study aims to give a historical analysis on the advancement of women's proportion in higher education and in the fields of research on the one hand, and on the other to explore the present situation of gender equality in the research and development sector.

LAW ON EQUAL OPPORTUNITIES

In consequence of our membership in the European Union and the obligatory harmonisation of laws, a new act was passed on equal treatment and the promoting of equal opportunities (Act CXXV of 2003) which has provided the broadest rights regarding equal opportunities so far. It gives the opportunity of positive discrimination in the process of law enforcement, provided it aims at the easing of the unequal opportunities of a certain social group. [11. § (1)] Furthermore, budgetary institutions employing more than 50 people as well as legal entities with major state-ownership are obliged to work out a plan of equal opportunities. Such a plan ought to contain an analysis of the situation of the underprivileged social groups within the business establishment, the measures taken by the employer in order to promote the equality of opportunities regarding not only financial affairs but also workplace safety, training and other aspects. The decree names the social groups that are considered to be taken as underprivileged in these terms:

a) women,
b) employees above 40,
c) the Roma,
d) physically challenged people,
e) employees with two or more children under the age of 10, or single parents with child(ren) under 10.

The operative Hungarian law guarantees the realisation of gender equality and obliges employers to equal treatment. However, no specific act deals with the question of salaries in spite of the acquis commaunitaire that discusses the subject.

Women Graduates

Women in Hungary have been allowed to study at universities from 1895 onwards due to a royal resolution, but the monarch Franz Joseph II restricted the studies of women: he only permitted them to attend art, medical and pharmaceutical faculties. There were no revolutionary changes in this regard until 1945, when women were still excluded from law, engineering, veterinarian and economical faculties. In consequence of the democratisation after 1945, radical changes took place regarding this matter as well: in August 1946 the democratic Hungarian Parliament passed a law creating equal conditions for men and women concerning tertiary education. Consequently all universities and colleges, except for the theological and military faculties, became available to women. As a result of this political decision the number of women graduates sky-rocketed in the second half of the 1950s, and this increase has been a trend ever since despite interruptions of varying significance.

Table 1: The number of graduates in comparison with the whole population—gender split, 1930–2001

Year	Total population	Total number of graduates	Graduated men	Graduated women	Women's percentage within the graduates
1930	8,685,109	86,885	78,451	8,434	9.7
1941	9,316,074	91,679	79,577	12,102	13.2
1949	9,204,799	96,561	80,526	16,035	16.6
1960	9,961,044	176,141	136,010	40,131	22.8
1970	10,322,099	300,558	206,897	93,661	31.2
1980	10,701,063	488,550	289,200	199,350	40.8
1990	10,381,959	693,160	371,860	321,300	46.4
1996	10,212,300	846,351	436,530	409,821	48.4
2001	10,078,138	934,036	463,652	470,384	50.3

Source: KSH 1990, 1997, 2001

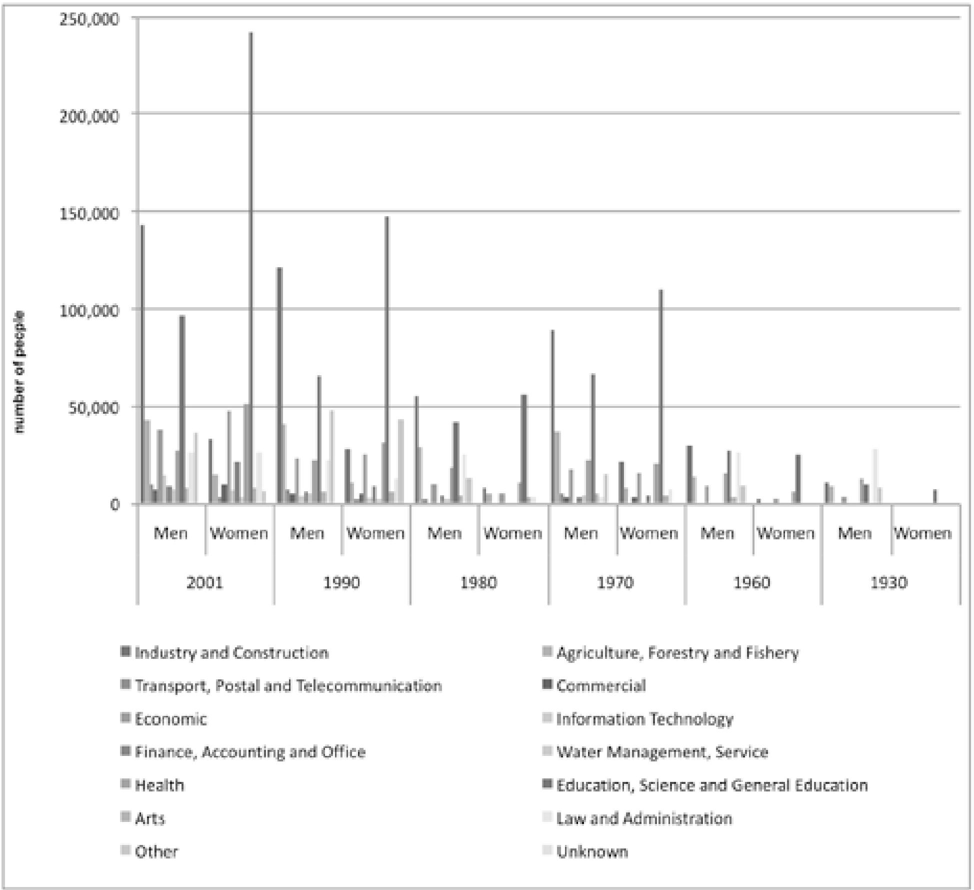
Before World War II the number of professionals holding a higher education diploma was relatively low, in 1930 they accounted for less than 2% of the population above the age of 25, while in 1990 they exceeded 7% and in 2001 even 11%. An especially dynamic increase began in the 1970s; it was in the past four decades, however, that numerical growth has been the most significant. The extent of the increase has been much more dynamic regarding women than men. In 1930 women represented less than 10% of all graduates; by 1996 their proportion approached 50% of all graduates and their number has quadrupled since 1970. The data of the 2001 census show that by the beginning of the 21st the number of women graduates exceeded the number of graduated men (KSH 2001).

By analyzing the age structure of the graduates interesting conclusions may be reached: the age structure of graduates is characterised by vigorous rejuvenation. In the case of women, the proportion of graduates under the age of 40 exceeds 70% in all types of qualifications. Moreover, in 1990 in the age group where the highest proportion of graduates belong to—the 35-39 age group (109,105 people)—the number and proportion of female graduates were higher than those of men (13.2% of women and 12.5% of men). At the same time 10.7% of men and only 3.2% of women between the ages of 60 and 64 had a diploma. Since 2001, in all the age groups between 20 and 49, women have accounted for a greater number of graduates than men.

When examining the gender split on the basis of the type of diploma, it can be observed that the structure of higher education has always been influenced by contemporary social, economical and political changes. It was by no accident that during the interwar period Hungary was called a ,'nation of jurists', since more than a third of the students in higher education attended law faculties and only 10% went to technological institutions. It was almost natural that the situation started to reverse after World War II; first the reconstruction, then the extensive industrialisation of the 1950s raised the number of students admitted to technological faculties. More and more qualified specialists were needed in all fields. The training of agronomists began to expand following the establishment of agricultural co-operatives, and the same could be observed regarding the training of economists after the introduction of the New Economical Mechanism in the late 1960's. The proportion of jurists decreased by a quarter between 1980 and 1990 as the numerous, pre-war jurist generation gradually retired.

In 1990, almost one third of graduates was constituted by those with educational, scientific or general educational[1] diplomas; they made up the largest section of graduates. The segment of those with a technical accounted for 20% and the segment of graduates with agricultural and medical diplomas ranged from 7 to 8%, yet the percentage of the latter has been decreasing in spite of the gradual increase in their number. The proportion of economists was approximately 7% while their number has been growing steadily since 1980, and the share and number of jurists have both been decreasing, reaching the present level of around 5%. By 2001, the proportion of graduates with educational, scientific or general educational diplomas reached 36.3%. Regarding the graduates with technical, medical and juridical degrees, the proportions of 1990 remained the same, while the proportion of agricultural graduates fell to 6% and that of the graduates in economics grew to 9%. In 2001, a new category emerged, the category of information technology graduates with a share of 2%.

Graph 1: Graduates by type of diploma, 1960, 1970, 1980, 1990, 2001



Source: KSH 1930-2001

In some fields the analysis of the gender split of university-level graduates clearly shows that certain professions have become feminised. In 1960, 52.2% of the employees in education, science and general education were men, while in 1970 their proportion reached only 42.6%. Unfortunately, in these fields the number and proportion of men have been continuously decreasing: in 1990 women's share was 69.3%, and in 2001 it increased to 71.5%. This means that in 1980 there were 166 women for 100 men working in the aforementioned professions, in 1990 the figure was 225 and in 2001 it was 251. The 1990 figures show that women's participation in other professions has also surpassed the critical margin of 50%. Their percentage among graduates was 54.1% in the field of commerce, 52.1% in economics and 59% in health care. By 2001 they were able to further increase their proportion in these fields: their percentage among graduates reached 58% in commerce, 55% in economics and 66% in health care. The proportion of women graduates in law and administration professions increased from 20.5% to 35.6% between 1980 and 1990, moreover it surpassed the critical 50% by 2001. This also means that the number of female graduates in law and administration areas grew from 12,090 to 25,921, i.e. it doubled during the last decade. Within the different qualification types, certain fields have become feminised such as pedagogy, specific professions in the medical field like anaesthetists, laboratory, school and x-ray doctors, or magistrates within juridical professions. Whereas regarding industrial and construction professions, in spite of a numerical growth in women's presence among the graduates, the growth in their proportion fell short of that of men, therefore women's percentage in these professions decreased. Despite the fact that the number of women earning technological degrees had never reached such levels before as in 2001—altogether 32,782 people—their 7% proportion was the lowest since 1970.

Table 2: The number of women among full-time students in higher education in the academic year 2004/2005—the number of degrees obtained on all courses

school owner	The number of diplomas											
	tertiary vocational training		college		university		further training		PhD/DLA		In total	
	total	wmn	total	wmn	total	wmn	total	wmn	total	wmn	total	wmn
state	1,568	1,049	29,060	19,259	18,343	10,741	8,339	5,431	883	381	58,193	36,861
church	0	0	1,620	1,282	1,521	971	405	280	10	2	3,556	2,535
foundation	120	89	2,970	1,697	0	0	81	42	0	0	3,171	1,828
in total	1,688	1,138	33,650	22,238	19,864	11,712	8,825	5,753	893	383	64,920	41,224

Source: OM 2005

In the last one and a half decades revolutionary changes have occurred in the field of education: the number of students in higher education has more than quadrupled from 102,387 to 418,852. The number of female students has almost quintupled, increasing from 51,507 to 247,333, and their proportion among university students reached 59.1% in the academic year 2004/2005. (Naturally the number of male students has also been growing, but to a lesser extent.) This also means that during the last two decades the underprivileged situation of women in higher education has basically come to an end. In recent years the number of women also has increased in areas that were traditionally considered to be male privileges: for example, currently 40% of the students of the agricultural universities and colleges and more than 20% of technical undergraduates are women. At the same time, in technological areas the growth rate of the number of male students is higher than that of women, although never before could so many women study in tertiary technological education as in the academic year 2004/2005. In chemical engineering, where the proportion of women is generally the highest, the percentage of their attendance has constantly been above 40% since the 1960's. At the Budapest University of Technology and Economics, which is the largest university in Hungary, 714 of the 1,296 students of the Faculty of Chemical Engineering in 2004/2005 were women, i.e. more than 55%.

Table 3: Trends in the numbers of undergraduates in all the higher-education institutions (Full-time courses, part-time courses and correspondence courses together 1937–2004)

Year	Male	Female	Total	Proportion of women %
1937	10,048	1,699	11,747	14.2
1950	24,778	7,723	32,501	23.8
1955	37,199	8,232	45,431	18.1
1960	29,867	14,718	44,585	33.0
1965	57,234	36,723	93,957	39.1
1970	46,104	34,432	80,536	42.7
1975	55,603	51,952	107,555	48.3
1980	50,852	50,314	101,166	49.7
1985	46,156	53,188	99,344	53.5
1990	50,880	51,507	102,387	50.3
1995	82,215	97,350	179,565	54.2
1999	118,019	140,296	258,315	54.3
2001	147,786	189,215	337,001	56.1
2002	157,631	212,159	369,790	57.4
2003	169,592	231,597	401,189	57.7
2004	171,519	247,333	418,852	59.1

Source: OM 1959–2005

Table 4: The number of female undergraduates in university and college education (1997–2005)

course type	Full-time	Part-time	Corresp.	In total	Full-time	Part-time	Corresp.	In total
School year	number of female students				proportion of female students			
1997/998	80,201	4,532	42,460	127,193	52.46	69.32	57.2	54.44
1998/1999	86,700	4,607	48,989	140,296	53.19	67.10	55.45	54.31
1999/2000	91,951	5,492	55,619	153,062	53.58	69.86	55.89	54.86
2000/2001	94,435	5,976	61,873	162,284	53.64	69.29	56.06	55.00
2001/2002	99,111	6,713	67,798	173,622	53.84	69.46	56.73	55.43
2002/2003	104,008	6,929	82,228	193,165	53.85	69.98	59.93	56.62
2003/2004	110,097	6,859	92,320	209,276	53.73	67.28	60.80	57.03
2004/2005	114,952	6,425	98,940	220,317	54.15	68.67	63.09	58.21

Source: OM 2005

Among full-time university and college students, the proportion of women was 48.8% in 1990, 52% in 2000 and 54.1% in 2005 (KSH 2006b). It is discernible from these figures that the rate of increase was higher before 2000 than since that time, and despite a dynamic expansion in the number of full-time female undergraduates, the gender split seems to be stagnating. The present distribution of students in higher education according to field of study is as follows:

Table 5: The proportion of female undergraduates in higher education according to field of study by the ISCED[2] categorisation on all the courses (2001–2005)

ISCED fields of science	2001/2002	2002/2003	2003/2004	2004/2005	2004/2005
	women %	women %	women %	women %	Number of women
Teacher training and education science	70.4	70.2	68.0	69.6	46,376
Arts	56.6	56.9	56.4	57.3	3,213
Humanities	67.2	67.4	67.8	68.8	23,205
Social and behavioural science	61.4	60.1	61.5	63.1	21,249
Journalism and information management	69.8	70.5	69.1	72.0	11,051
Business and administration	63.8	66.9	66.3	67.9	66,777
Law	57.3	59.0	60.2	59.3	11,186
Life sciences	61.1	62.8	65.4	65.9	1,600
Physical sciences	63.2	37.6	37.1	38.0	1,393
Mathematics and statistics	37.0	39.8	40.3	40.9	514
Computing	25.5	26.9	27.1	23.8	3,312
Engineering sciences	13.0	10.6	9.7	9.2	3,239
Manufacturing and processing	54.9	55.0	53.0	54.0	2646
Architecture and building	36.6	36.0	64.1	35.7	3,734
Agriculture, forestry and fishery	45.6	45.4	44.7	44.7	5,117
Veterinary	54.1	60.6	65.3	71.8	659
Health	71.7	73.1	75.1	72.8	13,439
Social services	81.6	81.5	81.5	82.7	10,429
Personal services	69.7	71.3	70.1	70.0	11,797
Environmental protection	53.7	53.7	52.8	52.3	3,451
Security services	22.6	33.3	30.8	37.2	2,946
In total	56.1	57.4	57.7	59.1	247,333

Source: OM 2005

In university basic training, from which the future researchers emerge, the proportion of women is the smallest in the fields of computing, engineering, physical sciences and mathematics in addition to security services. The proportion is also under 50% in the following areas: architecture and building, agriculture and manufacturing and processing. On the other hand the percentage of women is exceptional in the fields of social services, veterinary sciences, humanities, journalism and information management, business administration and life sciences.

In the 2004/2005 academic year the proportion of female PhD students was 45.8% in full-time courses, 41.7% in part-time courses and 41.7% in correspondence courses.

Table 6: The number of PhD students, 2004/2005

	Full-time course		Part-time course		Correspondence course	
	total	women	total	women	total	women
state universities	5,020	2,313	48	20	2,505	1,058
church universities	298	124	0	0	70	21
Total	5,318	2,437	48	20	2,575	1,079
Proportion of women, %	–	45.8	–	41.7	–	41.9

Source: OM 2005

Table 7: The gender split of the participants of PhD and Master programmes by field of science, 2005[3]

Type of training	Full-time			Correspondence			Part-time			In total		
Field of science	N total	N wmn	% wmn	N total	N wmn	% wmn	N total	N wmn	% wmn	N total	N wmn	% wmn
Natural sciences	1,040	416	40.00	294	119	40.48				1,334	535	40.10
Engineering and technology	751	133	17.71	420	93	22.14	32	13	40.63	1,203	239	19.87
Medical sciences	774	396	51.16	293	145	49.49				1,067	541	50.70
Agricultural sciences	277	141	50.9	237	105	44.3				514	246	47.86
Social sciences	764	352	46.07	842	318	37.77	16	7	43.75	1,622	677	41.74
Humanities	1,712	999	58.35	489	299	61.15				2,201	1,298	58.97
In total	5,318	2,437	45.83	2,575	1,079	41.90	48	20	41.67	7,941	3,536	44.53

Source: OM 2005

The table clearly shows that the proportion of women among PhD students is the highest in the field of humanities and health care.

The new Law on Higher Education (2005), which introduces the new system of higher education in accordance with the Bologna Process, aims to ,'exercise the postulate of non-discrimination and the respects of equal opportunities in higher education,' (2.§ 1) h)).

A new structure of tertiary trainings was introduced from September 2006 that consists of the following levels: basic training (bachelor), master's training, PhD training, tertiary vocational training and further vocational training. For example, after completing the basic faculty of social studies it will be possible to learn gender studies at the master's level as 'researcher of gender issues and expert specialised in equal opportunities'.)

One must not leave out of consideration the gender split of teachers in higher education either. In 1990 the proportion of women among the academic staff at universities was 33%, while it increased to 37.7% by 1999 and reached 38.65% in 2005. At the same time this growth was not reflected in the distribution of university and college positions and scientific degrees: in 1999 only 13.4% of professors, 29.5% of university and college associate professors, 40.9% of assistant professors and 46.6% of assistant lecturers were women. Compared to these figures, the situation worsened by 2005 when female employees represented 11.94% of professors, 26.83% of associate professors, 35.73% of assistant professors and 43.89% of assistant lecturers. The smallest number of women in higher-education institutions is in the field of engineering.

Looking at the figures of university admissions it can be claimed that women's participation in intellectual professions shall continue to rise in the following decades, which unfortunately also means that certain professions will be occupied almost solely by women, and the range of these professions is likely to expand. For example, police and military colleges and the national defence university opened their gates to external applicants after the change of regime in 1989/1990. The number of women with the same training as men and serving in non-administrative positions in the Hungarian Army was approximately one hundred in 2000.

There are also intellectual professions in which hardly any women can be found. In the job-hunting process, women graduates could only get the low-paid jobs that men had simply turned down. The number of men among elementary and secondary school teachers is remarkably low, with only those remaining who have a strong professional calling. In 1990, only 70% of graduated male teachers were employed in their primary profession, meanwhile for women holding the same types of diplomas this figure was 90%. The situation is similar in the case of medical professions where there is a strong correlation between feminised areas and earnings, or, to put it the other way around, most female doctors work in those professions where no additional income is available for them. Among the graduates of law faculties most women are employed in judicial positions. Judges were only allowed to undertake part-time jobs in a most limited area like education or research and the remunerations were low, so it was a less popular profession among men. This situation became a little bit more consolidated after the salaries of judges were increased in several steps in the middle of the 1990s and the proportion of men has been rising ever since. But since there is no hope for any significant advancement in the salaries of the non-competitive sectors of the state-financed sphere, this trend is set to continue over the next decade. Men with degrees will gradually abandon those professions which do not offer them salaries sufficient to provide for their families. This naturally causes a chain of problems with very serious social consequences. One such repercussion is clear in the case of educators: it is definitely not a fortunate situation if the young generations only meet female teachers throughout their kindergarten years to their secondary school graduation.

Another question emerges: why do men have to possess a, 'well-paid,' job? The answer to that is simple—because society expects them to maintain the family.

There is a further aspect to which researchers of social sciences have not paid any attention yet: the question of what the reason might be behind the fact that there are fewer male than female undergraduates at the end of the 20th and at the beginning of the 21st century. Due to a lack of surveys, we have to rely on information imparted by our young acquaintances. The most common answers are the following: girls are more diligent, more persistent in studying, while boys are happy to leave the school-bench behind and be able to learn a profession by means of which they can reach a relatively high level of income as quickly as possible. This latter argument seems to be supreme, so it is probable that the issue of salaries lies in the background. Those who continue their education at universities can only achieve high earnings in the long run.

Employer attitudes have also changed a great deal since the early 1990's. Before 1990, the age group of women with the highest earnings was the 'above 35' category, since those belonging to this group are considered as having a steady family life, and are probably over childbearing, their children having finished kindergarten or, in a better case, even their primary education. Recently their chances of employment have worsened, especially in the competitive sector where the employment of fresh graduates is preferred. For this reason, women with degrees hardly have the option of beginning a career around the age of forty after bringing up their children or having been in part-time employment.

It is a new tendency—resulting from the reconstruction of the economy after the change of regime—that mainly in the economic and financial professions lots of new, well-paid positions have appeared, and women have been able to enter these areas without any reservations. In this sense the career building of female managers can be considered a typical millennium feature, and it is different from the career building opportunities in all the other professions. Well-paid business jobs require almost 24 hours of work a day, great physical endurance and mental capacities. The women working in this field are naturally a match for men regarding their work performance, but it is startling to see that this female group of successful career builders, the youngest generation of women, has no time for their human relationships, for finding their partners in life, establishing a family and experiencing motherhood.

WOMEN ON THE LABOUR MARKET

Before the transition, women's presence on the Hungarian labour market was rather significant which can primarily be put down to the basic principles of the socialist regime and the promotion of the dual-income family model. In the 1990s the employment rate of women decreased.

Figures of the labour market.[4]

	1992	1995	2001	2005
Women				
Activity rate, %	57.3	50.3	52.4	55.1
Employment rate, %	52.3	45.9	49.8	51
Unemployment rate, %	8.8	8.7	5	7.5
Men				
Activity rate, %	71.9	67.4	67.2	67.9
Employment rate, %	64	59.5	62.9	63.1
Unemployment rate, %	11.1	11.7	6.3	7

Source: KSH 2006b

It is still typical of both EU and OECD countries that women with the same education and in the same position as men receive significantly lower earnings for their work. As the following table indicates, the situation is the same in Hungary.

Gross and net earnings of women in comparison with that of men (100%) in Hungary

	Gross			Net		
	Physical work	Intellectual work	In total	Physical work	Intellectual work	In total
1998	72.8	62.7	82.3	78.7	78.7	85.7
2000	73.3	60.1	80.5	78.2	78.2	83.8
2002	76.9	64	85	82.6	82.6	87.1
2004	76.8	65.4	86.3	83.5	83.5	89.4

Source: KSH 2006b

Teaching is one of the feminised professions in Hungary which can partly be explained by the low earnings in this sector. The proportion of women teachers is the highest in elementary schools and the lowest in higher education, but has increased in all types of schools since 1990.

Table 8: Teachers, 2004

	Elementary school		Vocational school		Secondary School		University, college (full-time course)	
	1990	2004	1990	2004	1990	2004	1990	2004
Women %	83.6	86.9	34	52.3	60.8	67.2	35.1	38.6
Men %	16.4	13.1	66	47.7	39.2	32.8	64.9	61.4
N in total	96,791	87,116	12,906	9,690	22,902	38,572	15,952	16,892

Source: KSH 2005

In higher education further up in hierarchy the number of women decreases among the academic staff.

Table 9: Academic Staff, 2004/2005

	university				college									
	professor	assoc. prof.	assist. Prof.	assist. lecturer	professor	assoc. prof.	assist. prof.	assist. lecturer	lang. teacher	PE teacher	dormitory teacher	other techers	in total	women
Full-time teachers in total	1,726	2,948	3,017	2,358	857	1,909	1,643	905	791	162	49	527	16,892	6,528
Women in full-time	206	791	1,078	1,035	241	835	926	552	612	46	13	193	6,528	n.d.
Women in part-time	248	358	415	268	89	172	207	130	51	16	5	87	2,046	572
Women employed with a contract of agency	129	185	169	181	82	220	216	189	263	75	4	3,136	4,849	1,836
In total	2,103	3,491	3,601	2,807	1,028	2,301	2,066	1,224	1,105	253	58	3,750	23,787	8,936
Proportion of full-time employed women, %	11.94	26.83	35.73	43.89	28.12	43.74	56.36	60.99	77.37	28.40	26.53	36.62	38.65	n.d.

Source: OM 2005

The present curriculum of teachers' obligatory further training does not include the issues of gender equality.

Endnotes

1 A statistical category which comprises the graduates of the humanities faculties of science universities.

2 ISCED = International Standard Classification of Education

3 Following the practice of KSH, the Hungarian Central Statistical Office, the field of law is listed among Social Sciences; environmental science, earth science, biology, chemistry, physics and mathematics are classified as Science, arts and psychology as Humanities, and materials science as Engineering.

4 Economically active: available labour force; employed and unemployed. Activity rate: the proportion of the economically active in society. Employment rate: the proportion of the employed compared to the whole population.

Women in Science

WOMEN IN SCIENCE BEFORE THE CHANGE OF REGIME

The career building of female graduates is a much slower process than men's and the situation of women seems to be even more complicated should they choose scientific research as their objective. Hungarian researchers have two options: they can either work at a university department or a scientific institute. The latter institutes also fall into two categories: they either belong to the Hungarian Academy of Sciences or are somehow related to the corporate sector. This research system was established in Hungary after 1949. The newly established institutions evolved rapidly during the 1950s, absorbing all the available researchers—almost all of them were men. Additionally it can be observed that despite the constantly increasing proportion of women in higher education from the 1950s onwards, women's participation in the work of scientific institutes lags behind the figures that might be expected from their percentage within the white-collar professions.

Table 10: The number of researchers and the proportion of women (KSH 1988, 1991 and 1997)

	1970	1972	1977	1980	1982	1987	1990
Number of researchers	23,460	34,365	34,924	38,705	37,302	38,232	30,256
Number of women	5,161	8,076	9,499	10,436	10,370	11,126	8,489
Proportion of women %	22	23.5	27.2	27	27.8	29.1	281

Source: KSH 1988, 1991 and 1997

Women constituted only 20% of researchers in the middle of the 1960s, 22% in 1970, 26% in 1975 and 27% in 1980. This rate naturally differs from field to field, but is the highest within the social sciences: 42% in 1982, 40% in 1998, while in engineering and technology the proportion of women was only 23% in 1982 (though much higher, 44%, in the field of chemical research).[1] Nevertheless, when one looks at absolute numbers, it is clear that the highest numbers of women were still working in technological research, simply due to the fact that research positions in technology and engineering made up 60-70% of all research positions.

A new system of scientific evaluation was introduced in Hungary after 1949, depriving universities of the right of granting scientific degrees, and instead conveying this right to the Hungarian Academy of Sciences (HAS). In accordance with the Soviet example, two new scientific degrees were introduced which differed from the European system: i) Doctor of Sciences (D.Sc); and ii) Candidate of Science (C.Sc), the latter being the equivalent of a PhD degree. Following the change of regime, the right of granting PhD degrees was returned to universities in 1993.

WOMEN IN SCIENCE AFTER THE CHANGE OF REGIME

Table 11: The changing of the number and the proportion of women among scientists and engineers between 1990 and 2005

	Women	Men	In total	Proportion of women %
1990	8,489	21,767	30,256	28.1
1995	7,092	13,767	20,859	34
1998	8,129	15,418	23,547	34.5
2000	9,537	18,339	27,876	34.2
2002	10,039	19,725	29,764	33.7
2003	10,647	19,645	30,292	35.1
2004	10,484	19,936	30,420	34.5
2005	10,731	20,676	31,407	34.2

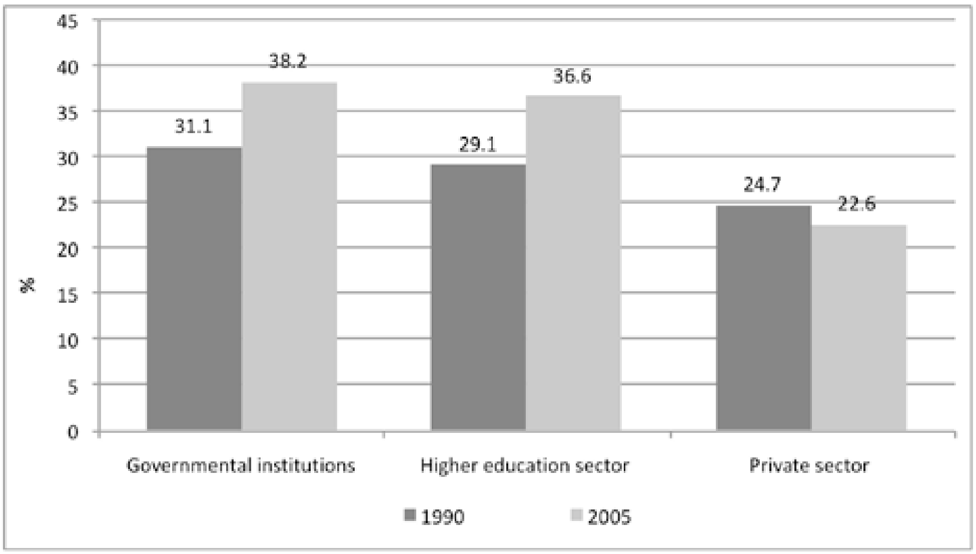
Source: KSH 2006b

It is clear from the chart that the rate of female researchers rose significantly in the early 1990's and since 1995 it has practically been at the same level without any change, while if we look behind the proportions remarkable shifts can be discovered in the number of researchers. The increase in the number of female researchers during the 1990–1995 period took place simultaneously with a drastic—almost with one third—drop of the number of research workers. By 2005 the total number of researchers had reached the former level of 30,000, but the proportion of women did not decrease. This drastic fall of research headcount can be explained by several factors. Firstly there were considerable cutbacks both in the academic sector and in the sector of research institutions after the change of regime and in addition to this most of the research institutions of large state enterprises were eliminated. Secondly, the earnings of scientific researchers remained at a low level and the better earning conditions available in the private sector of the economy tempted men away from the,'citadels of science'. This process affects men more than women because women find it much harder to reconcile the work hours and intensity expected in the private sector with their family and household duties, i.e. with the so-called traditional female roles. Thus the decrease in the number of males in scientific research can be explained by the phenomenon also described in the *Enwise report* (Blagojevic et. al. 2003), claiming that in our region men gather in the more profitable professions, and as the increasing number of researchers does not mean a simultaneous remarkable increase in the GDP-proportional R&D expenditures, it directly follows that men have not returned to these professions yet. Developments in the near future shall reveal whether this advancement proves stable or not.

It is a considerably new trend that the technology and the telecommunication industries offer new research positions. Naturally we may find women in these areas as well, but this has not been the object of detailed surveys yet.

The increase in female researchers has not been identical in the individual sectors: whilst in the budgetary institutions and in the institutions of higher education their proportion has increased compared to the data of the year 1990, it has fallen by 2.1% in the field of industrial research.

Graph 2: The proportion of women in the individual sectors 1990–2005



Source: KSH 2002a and 2006a

The social standing of research careers has gradually decreased over the past 15 years, several talented research workers moved to other fields or abroad, and the government commitment related to R&D subsidisation proved to be indecisive. The GDP-proportional R&D expenditures have also decreased since 1990, and have remained within the 1% margin (except for the 1.01% rate of 2002), which is outstandingly low in comparison with developed countries.

Obviously these factors have significantly influenced human resources and—similarly to any profession where earnings are rather low—the number of women increased among research workers. In decision-making bodies and positions this tendency is far less considerable.

Academic degrees

In a researcher's career not only the obtaining of a university diploma is a key moment but also the acquiring of an academic degree, since a scientific degree is practically essential for advancement.

Examining the absolute numbers in the data of the past 40 years, it can be observed that women's proportion among those who succeeded in obtaining a scientific degree in the field of engineering and technology has always been lower than the average of all scientific areas. Only two women were able to obtain the Doctor of Sciences degree between 1962 and 1991, while the yearly number of female Candidates of Sciences was between 6 and 57. In the meantime a significant growth could be seen in the number of men obtaining a scientific degree. During the first 10 years of the post-Communist era some signs of change could be witnessed: a moderate increase has begun. The number of women holding a scientific degree in engineering and technology mildly increased between 1991 and 2000: the proportion of women with a D.Sc. degree in engineering rose from 1% to 5.2%, while the same figure for Candidates of Sciences in engineering grew from 5.3% to 7.1%. Another important factor should be mentioned, however, namely that the increase in the proportion of women holding scientific degrees is the lowest in engineering and technology in comparison with all disciplines and is well behind with respect to men. Conversely, the fact that in 2000 the number of new male and female Doctors of Academy in the field of engineering and technology was the same—2 in both cases—might indicate better prospects.

The total number of people with any kind of scientific degree was 12,553 in 2005, where women constituted 19%. In 2005, 14 out of the 344 members of the Hungarian Academy of Sciences were women.

Table 12: Researchers with a scientific degree, 2005

	Doctors of HAS			Candidate/PhD		
	Total	Women N	Proportion of women, %	Total	Women N	Proportion of women, %
Natural sciences	942	107	11.4	2,269	519	22.9
Technical sciences	301	19	6.3	1,281	100	7.8
Medical sciences	509	71	13.9	1,860	416	22.4
Agricultural sciences	175	10	5.7	853	181	21.2
Social sciences and humanities	671	120	17.9	3,348	878	26.2
In total	2,598	327	12.6	9,611	2,094	21.8

Source: KSH 2006a

Considering proportions and numerical figures as well, most female degree-holders are in the fields of social sciences and the humanities. Yet both the above figures show outstandingly low levels regarding technical sciences.

Horizontal segregation

In 2003, 43% of all PhD degrees were held by women. This data corresponds exactly to the EU-25 average.

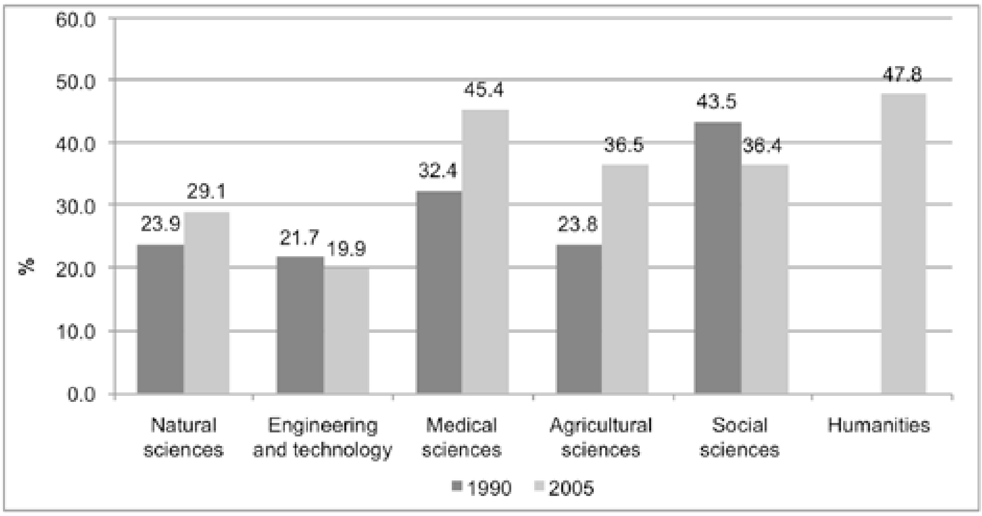
Table 13: Distribution of PhD students and researchers

Field of science	Number of PhD students, 2004/2005	Number of women	*Proportion of women*	Number of researchers, 2005	Number of women	*Proportion of women*
Natural sciences	1,334	535	*40.10*	4,871	1,416	*29.1*
Engineering and technology	1,203	239	*19.87*	8,939	1,781	*19.9*
Medical sciences	1,067	541	*50.70*	4,255	1,930	*45.4*
Agricultural sciences	514	246	*47.86*	1,964	716	*36.5*
Social sciences	1,622	677	*41.74*	4,808	1,749	*36.4*
Humanities	2,201	1,298	*58.97*	6,570	3,139	*47.8*
In total	7,941	3,536	*44.53*	31,407	10,731	*34.2*

Source: KSH 2006a and OM 2005; the authors' own calculation

Those disciplines where the proportion of women among PhD students currently exceeds their proportion among those in R&D can be seen in *Table 14*—this is practically the situation in every field except for engineering and technology.

Graph 3: The changing of women's proportion among Hungarian researchers by field of science between 1990 and 2005[2]



Source: KSH 2003a and 2006a

The figures itemised according to scientific fields shall be analysed in terms of the number of researchers employed and the expenditures for full-time researchers in each field.

It is evident that certain regularities which are considered general do not hold true once one examines the sectors separately; for instance that the proportion of women is always the highest in the field of humanities and lowest in industrial research.

Table 14: The distribution of researchers by sector

	Budgetary institutions			Higher education			Private sector			In total		
	N total	N wmn	% wmn	N total	N wmn	% wmn	N total	N wmn	% wmn	N total	N wmn	% wmn
Natural sciences	2,163	624	28.8	2,552	744	29.2	156	48	30.8	4,871	1,416	29.1
Engineering and technology	581	117	20.1	3,076	549	17.8	5282	1,115	21.1	8,939	1,781	19.9
Medical sciences	631	359	56.9	3,378	1,475	43.7	246	96	39	4,255	1,930	45.4
Agricultural sciences	756	340	45	942	307	32.6	266	69	25.9	1,964	716	36.5
Social sciences	722	242	33.5	3,936	1,456	37	150	51	34	4,808	1,749	36.4
Humanities	1,360	689	50.7	5,202	2,448	47.1	8	2	25	6,570	3,139	47.8
In total	6,213	2,371	38.2	19,086	6,979	36.6	6,108	1,381	22.6	31,407	10,731	34.2

Source: KSH 2006a, numerical data

While overall and in higher education the proportion of female researchers is the highest in the field of humanities, in budgetary institutions and the private sector their proportion is the highest in medical sciences. In these two sectors it is the field of medical sciences that employs the smallest number of researchers.

In the private sector by far the most researchers are employed in the field of engineering and technology, and it is interesting that this field also has the highest number and proportion of women. On the other hand, the proportion of women compared to men is also the lowest in engineering and technology within the private sector, the same as in the other sectors and in total. The other discipline where the proportion of women is the highest in the private sector is natural sciences. Only a few women can be found in the field of industrial research, however.

The aggregated dissimilarity index[3], which shows the proportion of researchers who should go to another field in order to equalise the male-female ratio in all fields, amounts to 23%. This index is 18% for higher education, 24% for budgetary institutions and 8% for the private sector.

The feminisation ratio[4] for all researchers is 51.9%. In the higher education sector there are 57.64 women for 100 male researchers, while this number is 61.71 in budgetary institutions and 29.22 in the private sector. There are only two segments that are female-dominated, medical sciences and humanities—both in budgetary institutions.

Table 15: Expenditures per full-time employees of research and development places in 2005

	Expenditures per FTE, million HUF		
Field of science	Budgetary institutions	Higher education	Private sector
Natural sciences	9.3	9.7	5.6
Engineering and technology	14.3	11.3	14.3
Medical sciences	10.1	7.3	18.3
Agricultural sciences	14.7	11.4	9.5
Social sciences	10.6	5.4	8.7
Humanities	9.8	4.9	1.4
In total	10.7	7.7	13.9

Source: KSH 2006a

In 2005, the research centres of the private sector spent the largest sum on R&D, whilst the proportion of women is the lowest here, and in addition, as shown in *Graph 2*, it shows a declining tendency. Comparing per capita expenditures and the proportion of women researchers, it is evident that it is not true in all fields in Hungary that the proportion of women is the highest where the per capita expenditures are the lowest.

Table 16: The proportion of women among researchers and per capita expenditures for full-time employees, in million HUF

	Budgetary institutions		Higher education		Private sector	
	Proportion of women %	Expenditures million HUF	Proportion of women %	Expenditures, million HUF	Proportion of women, %	Expenditures, million HUF
Natural sciences	28.8	9.3	29.2	9.7	30.8	5.6
Engineering and technology	20.1	14.3	17.8	11.3	21.1	14.3
Medical sciences	56.9	10.1	43.7	7.3	39	18.3
Agricultural sciences	45	14.7	32.6	11.4	25.9	9.5
Social sciences	33.5	10.6	37	5.4	34	8.7
Humanities	50.7	9.8	47.1	4.9	25	1.4
In total	38.2	10.7	36.6	7.7	22.6	13.9

Several conclusions can be drawn in the light of the above findings:

- In the case of budgetary institutions, the proportion of women is the highest in the fields of medical sciences and humanities, and the expenditures are the lowest in natural sciences and humanities.
- In the higher education sector, women's percentage is low and the expenditures are high in engineering and technology (the lowest proportion and the second highest rate of expenditures), and we find the opposite to be true in the field of humanities. The proportion of women is also high in medical sciences although the expenditures do not seem too low compared to other fields (the proportional value is the second highest while the expenditures are the third lowest). The expenditures are the highest in agricultural sciences, however, the proportion of women is not exceptional there.
- In the research positions of the private sector, the proportion of women is high and the expenditures are at a low level in natural sciences (the second highest proportional value and the second smallest expenditure). The proportion of women is the lowest in engineering and technology which hold second place in terms of expenditures. The expenditures are the lowest in humanities, but the proportion of women is far from the highest. Both the proportion of women and the expenditures are highest in the field of medical sciences.

WOMEN IN ENGINEERING AND TECHNOLOGY AND AT THE BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS

The distribution of doctors and candidates in engineering and technology by gender (1962–2002)

	Doctors in engineering and technology			Candidates in engineering and technology		
Year	Men	Women	In total	Men	Women	In total
1962	58	1	59	328	6	334
1967	76	2	78	467	7	474
1973	102	2	104	616	16	632
1980	157	2	159	777	28	805
1985	181	1	182	892	49	941
1991	207	2	209	1,008	57	1,065
2000	290	16	306	1,342	103	1,445
2002	286	15	301	1,325	104	1,429

Source: MTA 1991, 2005

The gender distribution of full-time university lecturers in technological higher education (1966–2005)

Year	Men	Women	In total	Women's proportion (%)
1966	1,616	271	1,887	14.4
1970	2,106	430	2,536	16.9
1975	2,712	676	3,388	20.0
1980	2,691	810	3,501	23.1
1985	2,672	888	3,560	24.9
1990	3,591	863	4,454	19.3
1995	2,455	729	3,184	22.8
1999	1,872	602	2,474	24.3
2002	1,995	584	2,579	22.6
2005	2,373	905	3,278	27.6

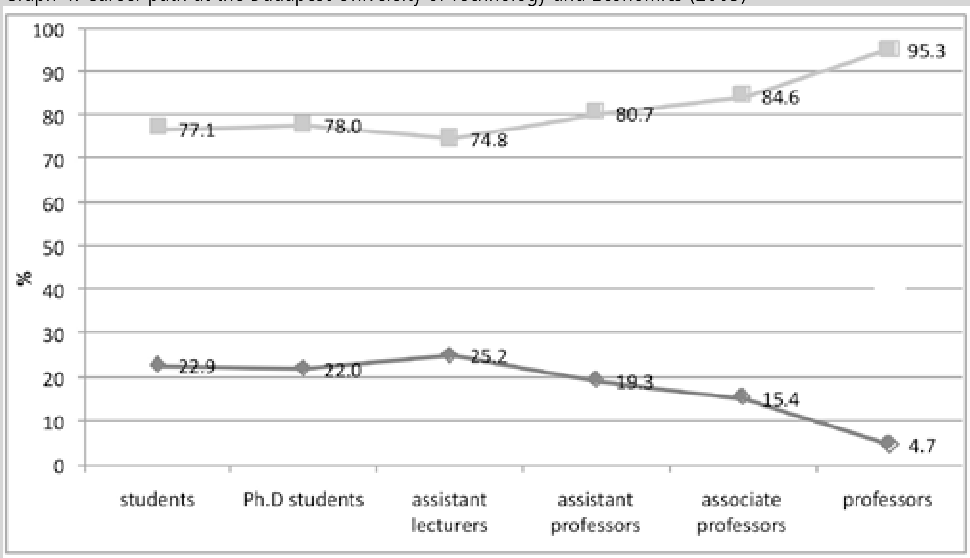
Source: OM 1966–2005

Full-time undergraduates at the technical universities (1958–2004)

Year	Men	Women	In total	Women's proportion (%)
1958	5,476	746	6,222	11.9
1966	8,703	2,187	10,890	25.1
1970	8,241	2,082	10,323	20.1
1974	8,399	2,041	10,440	19.5
1979	7,941	1,658	9,599	17.2
1984	6,943	1,434	8,377	17.1
1989	7,482	1,288	8,770	14.6
1994	9,410	2,299	11,709	19.6
1999	13,933	4,348	18,281	23.7
2001	16,480	5,298	21,778	24.3
2004	19,824	5,800	25,624	22.63

Source: OM 1966–2005

Graph 4: Career path at the Budapest University of Technology and Economics (2003)



Source: OM 2004

Vertical segregation

R&D statistics use three categories to describe research staff: i) scientists and engineers; ii) technicians; and iii) other staff. The distribution of women and men, as the following table indicates, is different in each sector.

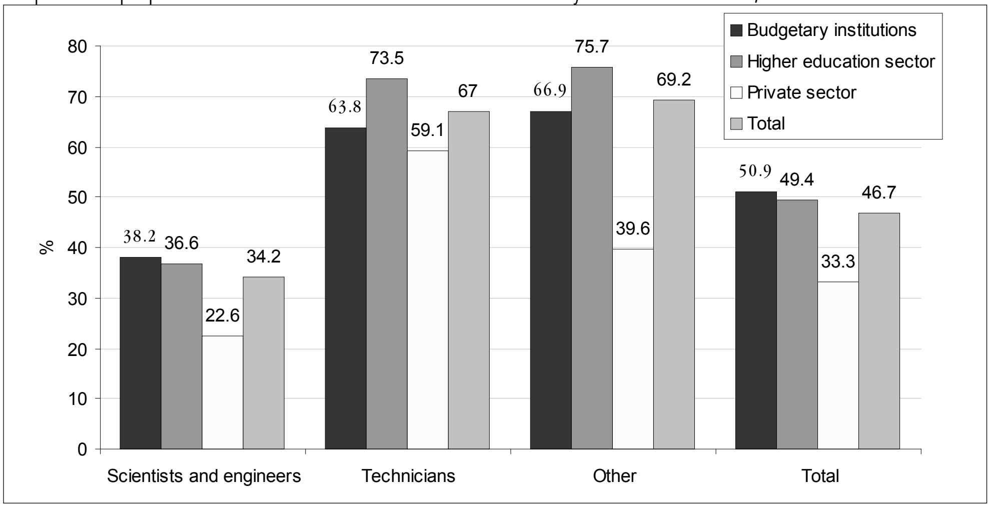
Table 17: Staff headcounts at Hungarian research centres in 2005

	Budgetary institutions	Higher education	Private sector	In total
scientists and engineers	62,13	19,086	6,108	31,407
of which women	2,371	6,979	1,381	10,731
proportion of women, %	*38.2*	*36.6*	*22.6*	*34.2*
technicians	2,465	3,937	2,261	8,663
of which women	1,572	2,894	1,337	5,803
proportion of women, %	*63.8*	*73.5*	*59.1*	*67*
other	2,949	5,679	1,025	9,653
of which women	1,974	4,299	406	6,679
proportion of women, %	*66.9*	*75.7*	*39.6*	*69.2*
total	11,627	28,702	9,394	49,723
of which women	5,917	14,172	3,124	23,213
proportion of women, %	*50.9*	*49.4*	*33.3*	*46.7*

Source: KSH 2006a

The proportions can clearly be seen on the following graph.

Graph 5: The proportion of women within the R&D staff divided by sectors and in total, 2005



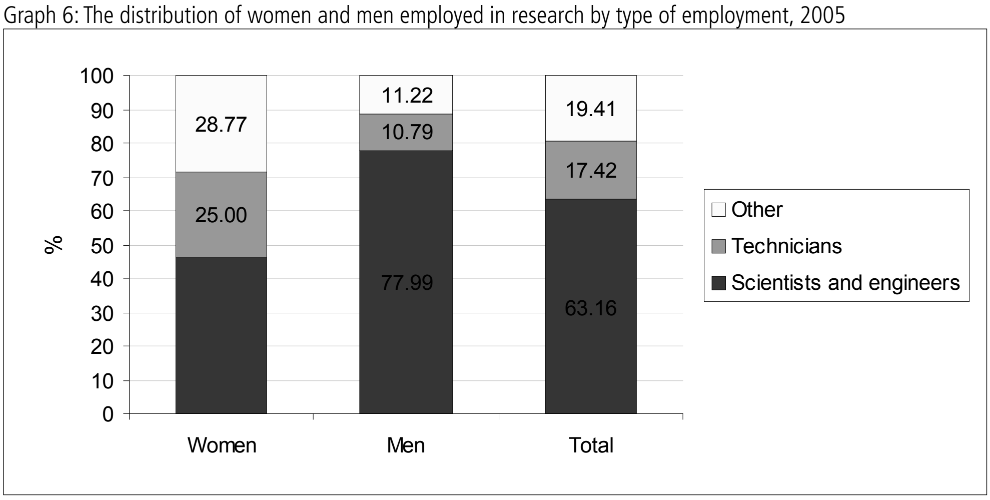
Source: KSH 2006a

Budgetary institutions employ women in the greatest proportion in R&D, but at the same time their number does not differ much from the number of those working in the private sector, while in higher education, where three times as many researchers and women are employed, the proportion of women is slightly lower. However, women in technician and other staff positions are employed in the biggest proportion—and number—in higher education.

Surprisingly, the largest gap regarding the proportion of women between scientists and engineers and the other positions can be found in the higher education sector and not in the private sector.

The proportional distribution of the whole female R&D staff by type of employment shows great differences compared to that of men, as the following graph indicates.

Graph 6: The distribution of women and men employed in research by type of employment, 2005



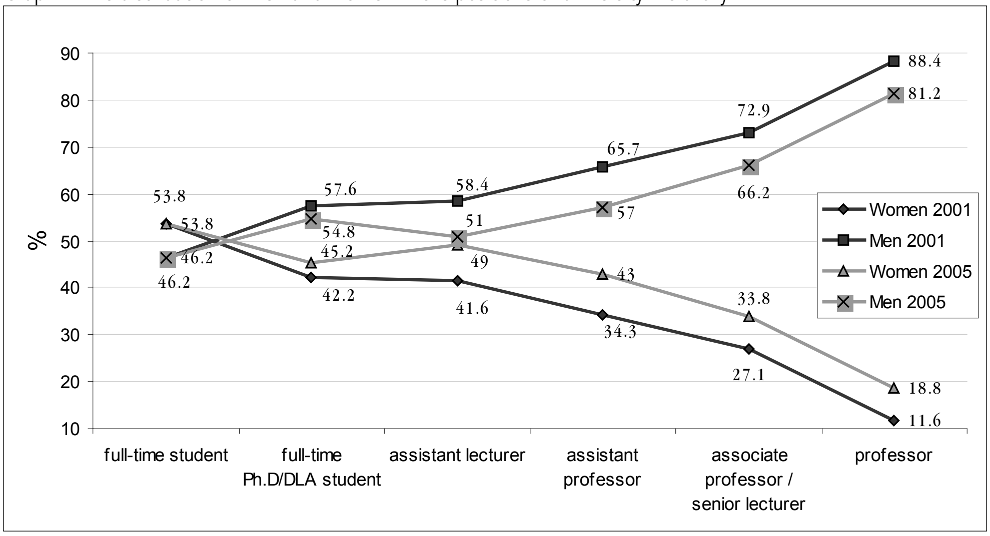
Source: the authors' own calculation based on the figures of KSH 2006a

While 46% of women work as scientists and engineers, 25% as technicians and 29% as other staff members, the same proportions regarding men are 78%, 11% and 11%.

Executive positions

The low proportion of women in the upper echelons of the scientific hierarchy underlines that research institutes are unable to catch up with social and economical changes like the increasing number of women in higher education and doctoral trainings.

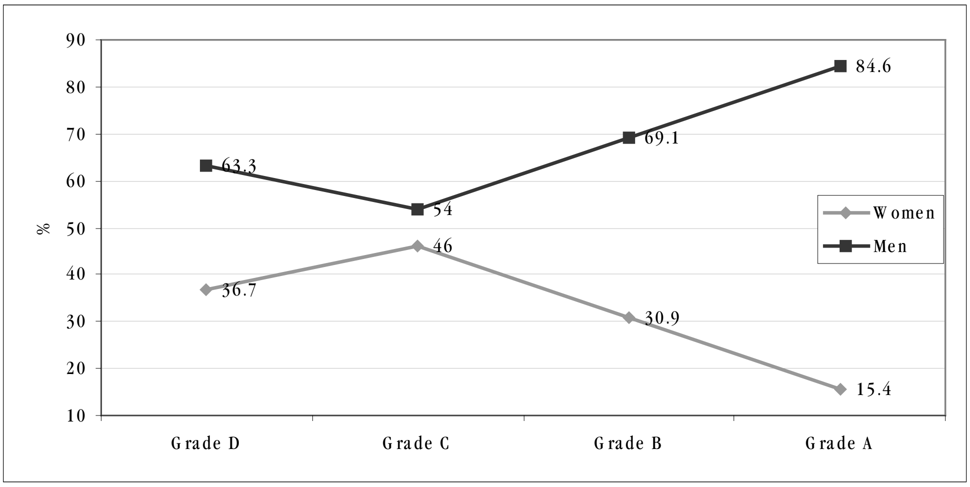
Graph 7: The distribution of men and women in the positions of university hierarchy



Source: KSH 2002a and 2006b, the authors' own calculation

These figures are much the same for the academic sector since many of the researchers work at an institution of the Academy and teach at a university simultanouosly.

Graph 8: EU-conformed figures of 2004 relating to Hungary[5]



Source: European Commission 2006b

The glass ceiling index[6] for Hungary is 2.3, while the EU-25 average is 2.1 (European Commission 2006b). This means that the glass ceiling effect proves to be more powerful in Hungary than in the EU-25 average, thus it is harder for women to reach executive positions.

The effect described by the so called, 'scissors-diagram,' also applies to Hungary. The state trains countless male and female talents but women gradually drop out over the course of time. This entails a great loss both for the given sector and the whole economy as society is deprived of the benefits of the money and energy invested in the training of this segment of human resources.

The scissors seem to have been closing over the past five years, yet it is uncertain whether this trend is to continue, cease or turn around. Based on examples from other fields it can be expected that if there is more money invested in research, providing better perspectives for research careers, men will return to this field and some of the women will once again be squeezed out of this profession.

This effect is underlined by the fact that the process of the infiltration of women into decision-making positions is advancing very slowly. There are almost no women among the members of the executive bodies of science policy, as illustrated by the table below, and in addition the proportion of women in the above mentioned bodies is lower than their presence among professors and Grade A scientists.

Table 18: Women in R&D decision-making (March 2007)

Name of Body	Number of members	Number of women	Proportion of female members, %
The Presidium of the Academy	23	1	4.35
HAS Governing Board	12	1	8.3
Members of the HAS Council of Doctors	25	1	4
Substitute Members of the HAS Council of Doctors	21	4	19
Science and Technology Policy, Competitiveness Advisory Board (4T)	11	0	0
Science and Technology Policy Council (TTPK)	17	0	0
Research and Development Innovation Council (KTIT)	15	0	0
Higher Education and Research Council	20	1	5

WOMEN IN POLITICS

Politics is the main area of decision-making in society. Although women constitute more than half of society, their level of representation in politics is significantly lower, which is a further obstacle to achieving gender equality. The most common indicator of this problem is the proportion of women among the members of the parliament.

Hungary occupied 33rd place (together with Russia) among the members of the European Council regarding the proportion of women representatives in national parliaments. Sweden took first place with 45.3%, Denmark second with 38%. The proportion for Hungary was 9.8% which was the lowest in the European Union excepting Malta.

The number and proportion of female MPs in Hungary after the change of regime.

Year	N	%
1990	27	7
1994	43	11.1
1998	32	8.3
2002	35	9.1
2006	41	10.6

Source: the official website of the Parliament of Hungary 2007

The proportion of women among political party candidates was 8.5% in 1990, 10% in 1994, 12.4% in 1998, 14% in 2002 and 16.7% in 2006, which marks an increasing trend (KSH 2006b), unfortunately this is not as evident in the composition of the parliament.

In those parliamentary committees that are relevant to our study, female presence has been on the upswing in recent years: the proportion of women was 9.55% (2 women out of 21 members) in the Committee on Employment and Labour in 2002 and 15.8% (3 out of 19) in 2006; in the Committee on Education and Science 0% (0 out of 21) in 2002 and 26.1% (6 out of 23) in 2006 (Koncz 2006).

The proportion of women among the 24 Hungarian representatives of the European Parliament is 33.3%. This phenomenon is, however, typical of many countries, where the proportion of women among the members of the European Parliament exceeds that of in national parliaments.

Work-life balance

Finding the right balance between one's professional and private life is a key factor of long-term career success and of the wellbeing of the individual. This is a most difficult challenge for both men and women working in scientific areas—even if they are unmarried and/or have no children—because of the unconventional working hours and the mobility necessary for advancement.

According to the figures of a survey conducted in the 1980s, 34.5% of women graduates and 40.6% of female researchers are childless. Among female scientists above the age of 50 the divorce rate is higher in all age groups than among women of the same age in general (Palasik 2003). These facts are confirmed in the study of Faragó (2000), who also claims that the number of children of female intellectuals is traditionally low, and this particularly applies to female scientists. Unfortunately no such comparative analysis has been made on this subject recently.

The marital status of people holding a scientific degree in 1997 can be summarised in the following table (KSH 1998):

Table 19: The marital status of people holding a scientific degree

Age group	Unmarried	Married	Married, separated	Widow/widower	Divorced
Women					
30–39	24.2	72.7	–	–	3.1
40–49	15.6	66.3	2.6	1.1	14.4
50–59	12.8	64.8	3.1	4.1	15.2
60–69	8.8	52.0	3.6	24.3	11.3
70+	19.8	29.4	2.4	35.3	13.1
In total	14.6	60.5	2.7	9.1	13.1
N	111	464	21	70	100
Men					
30–39	13.8	82.5	1.5	–	2.2
40–49	3.3	88.2	2.5	0.7	5.4
50–59	1.3	89.5	3.1	1.1	5.0
60–69	1.3	89.6	1.4	3.7	4.1
70+	1.1	82.7	2.4	10.7	3.2
In total	2.7	87.4	2.3	3.3	4.3
N	90	2 937	77	111	145

The proportion of single individuals living alone is much higher among women with a scientific degree than among the same age group of the whole population, meanwhile in the case of men the situation is the opposite. The table clearly shows that there is a great difference between the marital status of male and female degree holders, as more men are married than women in this group.

THE SYSTEM OF PARENTAL SUBSIDIES

In 2007 women received child-care allowance (GYES) for each child as a subjective right. It can be requested in two cases: i) if the parent had not been employed prior to the birth of the child; or ii) for one additional year after the child reached the age of two. The sum is equivalent to the smallest sum of the current old-age pension, from which 8.5% is deducted as pension contribution. At present this amounts to HUF25,800[7] per month, and HUF51,600 in the case of twins. If the parent had not been employed prior to the birth of the child, the child-care allowance may be claimed from the date of the birth of the child until the age of three or until the age of 10 in the case of children with chronic illnesses or serious disabilities. The parent (either the mother or the father) may not carry on any gainful employment before the child is one year old, but after that can work up to 8 hours a day. After the age of one, the child may be placed in any institution providing day-care without any temporal limitation, but if the child-care allowance is paid to one of the grandparents the child may not spend more than 5 hours a day in an institution.

If the parent had been employed prior to the birth of the child, he/she is entitled for a much higher amount of allowance called child-care fee (GYED), and after the expiration of entitlement the parent may claim GYES. GYED is 70% of the annual income, but not more than HUF87,000 a month, and may be granted for two years. It is not a subjective right, but is insurance-related (8.5% pension contribution and personal income tax is deducted).

A parent, a foster-parent or a legal guardian with three or more under-age children may receive child-care support (GYET), the sum of which is the equivalent of the smallest sum of the old-age pension, which is currently 25,800 HUF. The support may be claimed from the third birthday of the youngest child until his/her eighth birthday.

The monthly sum of the family allowance established by the Act LXXXIV of 1998 from January 1, 2007 is calculated according to the following:

1. HUF11,700 for a family with one child,
2. HUF12,700 for a single parent with one child,
3. HUF12,700 per child for a family with two children,
4. HUF13,800 per child for a single parent with two children,
5. HUF14,900 per child for a family with three or more children,
6. HUF15,900 per child for a single parent with three or more children.

Causes of difficulties in career development

One of the reasons behind the much slower career building of women is the fact that a strong social belief persists that career success is primarily, 'men's business'. The approach of society is basically male-centric, men, but in many cases women themselves, being unwilling to accept a female superior. The real reason is likely to be found somewhere else, however; career progression is blocked by the female roles: motherhood, household chores and the duties as come along with them, the burden of which cannot be put on the other members of the family to the same extent as would be acceptable in the case of male graduates. Maternity benefit is generally used by women, apart from a few men, although men are also allowed to do so by law. Holding the family together is always the task of women, and maintenance of the household has still not become much easier despite the development of household technology and the widening range of pre-prepared foods, as their operation and preparation also requires time and money. Furthermore, the incomes only allow a small number of people to pay for services that speed up the completion of housework and the provision of the family.

Attention needs to be drawn to a very serious problem concerning the future. This is the phenomenon of basic changes in the graduates' habits with regard to establishing a family. While in 1980 85% of graduates lived in a family[8] (and the rate of those living in a family was 86% in general in society), in 1990, despite the fact that their number grew by more than 200,000 people in ten years, only 39% of them had set up their own families (while the same figure for the whole population was 83%). Of course, this is also influenced by the fact that the stratum of graduates is getting younger and they postpone starting a family. 79% of male, but only 64% of women graduates living in a family are married. 34.5% of graduated women are childless. As many as 11% of married female graduates are childless, and the proportion of those with only one child is 29%. The proportion of graduated fathers bringing up a child alone is 11%, whereas the same is true for 26% of graduated mothers. This latter number is significantly higher than the national average which is 19% (KSH 1990, 1997, 1999, 1998). These are just the numbers, but even the idea of prospective social tendencies marked by these numbers is daunting. If this trend continues, an even smaller number of graduates will have their own families in the following decades, fewer of those living in a family will decide to bear a child than today, and the proportion of the divorced will continue to rise. There have never been so many single women in society, and and this concerns women scientists in particular than in recent years.

Awareness of the issue

Neither equal opportunities for women, nor research and development are central issues in the public discourse and the media today, therefore the equal opportunities of women in the field of research is in a doubly underprivileged situation. Male and female researchers are either not aware of the problem, or reject -or even deny- its existence in default of appropriate information and orientation.

The state's responsibility-taking is remarkably inadequate in this area, although some advancement has been made in the past few years. In autumn 2005, an Operative Committee was established to help the work of the Hungarian member of the Helsinki Group[9]. At the beginning of 2006, a proposal for a government resolution was made including complex measures to improve the situation of female researchers, but in the end it was never approved.

It was part of the reform plans of the Hungarian Academy of Sciences to support the career of female researchers by creating family friendly workplaces, establishing special prizes and grants for women and taking into consideration special factors in assessing the allowances of women at the age of establishing a family as well as by promoting successful female careers, but there is no reference to these topics in the final reform proposals.

The question of introducing programmes for supporting the career and equal opportunities of women with the aim of increasing women's proportion in those fields where female researchers are under-represented has not yet been considered seriously in Hungary, despite the fact that such programmes are running efficiently in other countries.

The achievements realised by women in different fields of science have only scant mention in the history of science, as if female accomplishments had been forgotten when, 'history,' was being written. For example, the IV/1 volume of the series *Hungary in the 20th century* published by the Babits Publishing House of Szekszárd in 1999 presents Hungarian scientific achievements in engineering and sciences on 700 pages without mentioning several important female scientists. All the 102 portraits of the volume depict men and there are only three women among the 38 authors of the book. The same can be said of Professor Marx's *Voice of the Martians. Hungarian Scientists Who Shaped the 20th Century in the West* that created a stir both in Hungary and worldwide. The 20 chapters of the book compiling researchers' profiles presents only men, while the chapter 'The Encyclopaedia of Martians', which contains 52 biographies, has only one article about a woman—the only female researcher is the economist Marina Whitman-Neumann, the daughter of Janos Neumann and member of The Academy of Arts and Science of the USA (Marx 2000). Considering these facts we find it essential to highlight those Hungarian female researchers who accomplished important achievements in Hungary and abroad, and for this reason a book with the short biographies of Hungarian female scientists is to be published in 2009.

Endnotes

1 The term 'researcher' refers to the employees of the university, academic and corporate spheres. The figures are from 1982: Tamás Pál 1984; Hrubos Ildikó 1999.

2 In 1990, humanities were classified as social sciences, but have been registered as a different category since 2000.

3 The proportion of male and female researchers that should change fields so that the proportion of women would be equal to that of men in all fields of science.

4 The number of women corresponding to100 men in a given sector.

5 These values are also based on the statistics of higher education. (WIS Database July 2004 – notes) Grade D: PhD students and researchers without a scientific degree; Grade C: postdoctoral researchers; Grade B: senior researchers; Grade A: leading researchers.

6 The indicator of vertical segregation is the glass ceiling index (GCI). GCI = P/ Pa=, where P = the proportion of women at level A, B and C, and Pa= the proportion of women at level A. If this value is bigger than 1, it means that women are under-represented at level A, and the higher the value of the index, the thicker the ceiling is, and the harder it is for women to get to an upper level.

7 http://mta.hu/index.php?id=435

8 http://mta.hu/index.php?id=434

9 http://mta.hu/index.php?id=933

10 http://4t.gov.hu/main.php?folderID=1234

11 http://4t.gov.hu/main.php?folderID=1247

12 http://www.nkth.gov.hu/main.php?folderID=912

13 http://www.ftt.hu/

14 Approximately EUR100.

15 Statistics regard couples living in a common-law marriage and single parents with children as families.

16 A committee established by the European Commission of government representatives in 1994, the aim of which is the promotion of the participation and equality of women in the sciences on a Europe-wide basis

Bibliography

Blagojević, M., Havelková, H., Sretenova, N., Tripsa, M., Velichová, D. (szerk.) (2003): Waste of talents: turning private struggles into a public issue, Women and Science in the Enwise countries, European Commission

European Commission (2006b): She Figures 2006.

Faragó Péter (2000): Nők a tudományban – A tudós nők helyzete Magyarországon a 20. században. In Balogh Margit, S. Nagy Katalin (szerk.): Asszonysorsok a 20. században, BME Szociológia és Kommunikáció Tanszék és Szociális és Családvédelmi Minisztérium Nőképviseleti Titkársága, 2000.

Haraszthy, Ágnes (1993): Equal Opportunities for Women? Women in Science in Hungary. In Veronica-Stolte Heiskanen (ed.): Women in Science: Token women or gender equality. Berg, Oxford, pp. 193–198.

Hrubos Ildikó (1994): Férfiak és nők iskolai végzettsége és szakképzettsége. In Hadas Miklós (szerk.): Férfiuralom. Replika Kör, Budapest, pp. 196–208.

Ildikó Hrubos ed. (1999): Women in scientific careers. Report on the activities connected with the question "Women and Science". Kutatási jelentés.

Ilonszki Gabriella (2005): Nők a politikában In Az Európai Unió és Magyarország, In Nagy Ildikó, Pongrácz Tiborné, Tóth István György (szerk) (2005): Szerepváltozások – Jelentés a nők és férfiak helyzetéről 2005, TÁRKI, Szociális és Esélyegyenlőségi Minisztérium, pp. 57-69.

Koncz Katalin (2006): Nők a politikai hatalomban. Számvetés a rendszerváltástól napjainkig. Magyar Női Karrierfejlesztő Szövetség.

KSH (1988): A tudományos kutatók képzettsége, 1987. Budapest.

KSH (1990): Az 1990. évi népszámlálás adatai. Felsőfokú végzettséggel rendelkezők adatai. Központi Statisztikai Hivatal, Budapest.

KSH (1991): Tudományos kutatás és kísérleti fejlesztés, 1989. Budapest.

KSH (1995): 1990. évi 20%-os reprezentatív adatok. A KSH Népszámlálás demográfiai csoportjának kézirata, Budapest.

KSH (1997): Mikrocenzus, 1996. A foglalkoztatottság alakulása 1980–1996. Budapest.

KSH (1997): A tudományos kutatók képzettsége, 1995. Budapest.

KSH (1998): A tudományos fokozattal rendelkezők anyagi viszonyai, családi háttere és mobilitása 1997. Budapest.

KSH (1999): Termékenységi adatok. Budapest.

KSH (2001): 2001. évi népszámlálás adatai. Felsőfokú végzettséggel rendelkezők adatai. http://www.nepszamlalas.hu/hun/kotetek/30/tables/load1_1.html. 2007. március 27.

KSH (2002a): Nők és Férfiak Magyarországon, 2001. Szociális és Családügyi Minisztérium, Budapest.

KSH (2003a): Nők és Férfiak Magyarországon, 2002. Foglalkoztatáspolitikai és Munkaügyi Minisztérium, Budapest.

KSH (2005a): Nők és Férfiak Magyarországon, 2004. Ifjúsági, Családügyi, Szociális és Esélyegyenlőségi Minisztérium, Budapest.

KSH (2006a): Kutatás és fejlesztés, 2005. Budapest.

KSH (2006b): Nők és Férfiak Magyarországon, 2005. Szociális és Munkaügyi Minisztérium, Budapest.

Linková, M., Mladenić, D., Papp, E., Saldova, K. (2007): Gender Issues in Science as a Luxury. Enwise follow-up activities in Central Europe.

Marx György: A marslakók érkezése. Magyar tudósok, akik nyugaton alakították a 20. század történelmét. Akadémiai Kiadó, 2000.

MTA (1991): A Magyar Tudományos Akadémia évkönyve, 1962–1985. Budapest.

Nagy Beáta (2001): Női menedzserek. Aula, Budapest.

Nagyné Szegvári Katalin, Ladányi Andor: A nők az egyetemeken I. Küzdelmek a nők egyetemi tanulmányaiért. Budapest, 1976. Felsőoktatástörténeti tanulmányok.

OGY (2007): Az országgyűlés honlapja: www.mkogy.hu, 2007. március 27.

OM (1937–2005): Statisztikai Tájékoztató. Felsőoktatás. 1958/59–2005/2006. Budapest, Oktatási Minisztérium.

Palasik Mária (2003): A magyar nők a műszaki felsőoktatásban, a mérnöki pályán és a műszaki tudományokban a XX. században, Múltunk, 2003/3. pp. 132–159.

Palasik, Mária (2002a): Women in Technical Higher Education and in the Sciences in 20th Century Hungary. In Hungarian Studies Review, (Canada) Vol. XXIX, IB2 pp. 25-49.

Palasik, Mária (2002b): Women at the Technical University of Budapest in the 20th century. In Wie natürlich ist Geschlecht? Gender und die Konstruktion von Nature und Technik. Ursula Pasero-Anja Gottburgsen (Hrsg.) Westdeutscher Verlag, Wiesbaden, 2002, pp. 167-177.

Papp Eszter (2004): Equal opportunities in research in Hungary. In The effects of globalisation on national and international socio-economic processes, presentations of the I. national conference of the BUTE GTK Engineering and Management Doctoral School, Budapest, 9 November 2004., pp 235-243.

Papp Eszter (2007): A nők és férfiak közti esélyegyenlőség helyzete a kutatás-fejlesztésben Magyarországon nemzetközi összehasonlításban, Ph.D.. értekezés, kézirat.

Vámos Éva (1997): A nők műszaki és természettudományos oktatása. In Nagy Beáta, S. Sárdi (szerk.): Margit. Szerep és alkotás. Női szerepek a társadalomban és az alkotóművészetekben. Csokonai Kiadó, Debrecen, 1997, pp. 205–213.

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WOMEN WITH A SPINE OF STEEL IN POLISH SCIENCE

Elzbieta H. Oleksy

Foreword
Is Science Gendered?

Magdalena Środa

In 1811 during a reverie, an English governess, Ms Weeton, wrote in her diary: 'Oh, how much I have burned to learn Latin, French, the Arts, the Sciences, rather than the dog trot way of sewing, teaching, writing copies and washing dishes every day. Why are not females permitted to study physics, divinity, astronomy etc., with their attendants such as chemistry, botany, logic, mathematics'[1].

For hundreds of years since the establishment of the Greek Academy and then – much later – in the era of the first universities, only men obtained an education. Women from the upper social spheres learned music, embroidery and the art of running the household, but never mathematics, physics or rhetorics, because – as great minds argued – women are neither capable of learning science, nor of serious participation in culture, nor, generally, of thinking. Women from lower social spheres simply worked, without a reward, and they certainly would not even have heard about science.

> *Science, it would seem, is not sexless; she is a man … Many years were spent waiting before the sacred gates of the universities and hospitals for permission to have the brains that professors said that Nature had made incapable of passing examinations examined. When at last the permission was granted, the examinations were passed*[2]
> -writes Virginia Woolf.

Today, this view, which for years had been regarded as the scientifically proven truth, is an amusing superstition. Nevertheless this 'today' thus far has only lasted for several decades; during this time, women have had, equally with men, the right to education, scientific work and a career. Furthermore, they have made use of this right, in an extremely energetic, not to say a greedy, way.

The following report is a compendium of the scientific activity of women in Poland. It contains a bit of history and detailed statistical data, showing how many women have followed a scientific career. First and foremost, it reveals the growing number of women with high educational aspirations, as well as the increase of those who are professionals in the sciences. The analitical context for these data is the recent history of Poland (especially after the post-Communist transformation of the political system) as well as that of the world. The results of comparative research demonstrate what position our country occupies within the international ranking of Polish women's participation in science. On the whole, it is not a bad one.

The report also contains information on negative phenomena, not so much limiting women's access to chosen fields of study, as hindering their scientific careers and thus making it difficult to take advantage of the opportunities and possibilities provided by higher education on equal terms with men. Therefore, the report analyses (and defines) such phenomena as: the *glass ceiling,* the *sticky floor* (with regard to women) and the mysterious *glass escalator* (with regard to men). Women, despite their tremendous activity, are not able to overcome all the stereotypes constructed by long-standing tradition, as well as by education, or the dominant models of socialisation (according to which girls are in a way obliged to be obedient and protective, while boys should be winners focused on their careers). Also, stereotypes turn out to be the heaviest obstacles to the development of careers of women in science. One of the authors of the report, Iza Desperak, on the basis of her own experience, puts it straightforwardly: 'university is gendered'; it is still male. The majority of women in the academia would agree with her. Therefore, the goal is, for both the university as a workplace, and for science as a lifestyle model, to be neutral regarding gender. The point is that careers in this field should depend on the ability, knowledge and talent of particular individuals, not on their gender.

Endnotes

1 V. Woolf, *A Room of One's Own*, *Three Guineas*, Sic!, Oxford University Press 1999, p. 240.

2 Ibid, p. 322.

Introduction

Elżbieta H. Oleksy, Paulina Bunio

For nearly four decades, international women's organisations have questioned the exclusion of the problematics of women from public debate, including the issue of their participation in science. Which philosophical and social practices have led to the conspicuous lack of women in scientific and technical disciplines? Who is responsible for their relative underrepresentation at the higher levels of the scientific hierarchy? Who allowed for the serious neglect of areas crucial to the lives of women, such as reproduction, health, social inequalities, etc.? Why, until very recently, have most medications been tested only on men? These are some of the questions, which have been posed by generations of feminist researchers, among whom, arguably the most outstanding, is Sandra Harding, who was the first to champion the situation of women in science[1].

Today, these are, obviously, rhetorical questions. The individuals responsible for the above exclusions are those who decided that science, as well as the social and financial policy supporting it, seen from the perspective of male scientists, apply to all people, irrespective of gender. Now it is common knowledge that such policy has led to an enormous waste of women's talents.

Over the past forty years much has changed, especially in highly developed countries. More women (although still far fewer than men) choose a career in the sciences. Women now earn more and enjoy higher social status. Although the ideal is still very remote, it is inspired by these changes. As the imagination of many women around the world was aroused by the achievements of Maria Skłodowska-Curie, the many accomplishments of contemporary female researchers will encourage their successors.

The following report has been prepared as part of an international project under the acronym WS DEBATE[2], which was carried out with the financial support of the European Commision by a consortium of five research centres in five countries of Central Europe. The main aim of the project is to provoke public debate on the situation of women in science, a debate that might cause a change in the perception of the careers of women scientists, as well as a revision of state policy in this regard.

WS DEBATE Project is a continuation of the earlier initiative of the European Commission which promoted gender equality and assesed the situation of women in science in European Union member states. The report emphasises the activities undertaken by the Women and Science Unit of the **European Commission Directorate General for Research**[3]. The period of the Unit's greatest activity, which brought about a profound change in the awareness of the Europeans as regards the situation of women and science, took place between the years 1999 and 2005. During that time, the Unit promoted both the policy of women's participation in various expert committees on science and in EC research projects, as well as promoting gender issues. The Women and Science Unit became an institution crucial to progress in both of these dimensions. The goals of the unit are phrased in its adopted formulae: GE (gender equality) = GD (gender dimension) + WP (women's participation).

The adoption of the above equation not only emphasises the participation of women in science but also, importantly, acknowledges the key role of 1) Gender Impact Assessment Studies — an undertaking without precedence, both at the European as well as the global level, and 2) an assessment of the situation of women scientists in the EU.

One of the results of the first Gender Impact Assessment Study was to establish expert groups, which evaluated the situation of women scientists in Europe: the Helsinki Group and the Enwise Group. The former, created in 1999, consisted of women representatives of the governments and female researchers from 32 countries. Based on the results and recommendations of the report entitled 'Science Policies in the European Union — Promoting excellence through mainstreaming gender equality' (Osborn 2000), the Helsinki Group deepened the analysis of the problem, analyzing the situation of women scientists within the same scientific area, focusing in particular on policies promoting women in science in the participating states. The Helsinki Group report, 'National Policies on Women in Science in Europe' (European Commission, 2002), pointed out the current need to prepare another report, this time focusing only on the countries of Central and Eastern Europe. The communist past and the controversial processes of decentralisation after 1989 have shaped a different reality for researchers, including women, than in 'old' Europe.

Thus, in 2002, a third group of women experts in this part of Europe was established. Its members were selected from among different scientific disciplines representing academies of science, universities, and research institutes, as well as business institiutions. It came to be known as ENWISE Expert Group (**En**large **W**omen **I**n **S**cience to **E**ast). ENWISE Report, 'Waste of Talents: Turning Private Struggles into a Public Issue. Women and Science in the Enwise Countries', was published by the European Commission in 2004. Regardless of the differences, all the three reports unanimously raised, *inter alia*, the problem of too low participation of women in scientific and engineering disciplines. The ENWISE Report also showed that in post-communist Central and Eastern Europe, the majority of women scientists were employed in low-ranking and poorly paid academic positions, as well as in the less attractive and, therefore, more underfinanced areas of research. Women faced greater difficulties in achieving career advancement and obtaining higher-level degrees. Marginalisation and exclusion from academic networks and the lack of knowledge regarding the problem of gender equality as a first step in countering discrimination within academia seem to be shared features of all the states of Central and Eastern Europe. These factors effectively prevent women from obtaining satisfactory work and developing research careers and also lead to their talents being wasted.

This report concentrates exclusively on women researchers in Poland. Their situation is clearly revealed by a study called 'The History of Polish Science' ('Historia Polskiej Nauki'), available on the website of the Ministry of Science and Higher Education, in the 'Science For Everyone' section[4]. It first introduces well-known Polish universities and other scientific institutions, then focuses on the most outstanding representatives of Polish science, from the time of Copernicus to the present. The overview includes all fields, from astronomy to linguistics, along with 146 profiles of those responsible for the most brilliant achievements of Polish science. From our research perspective, the important question is: how many women are represented in this group? The answer is: **one**, Maria Skłodowska-Curie, who gained her fame at French universities. Her gender was the sole barrier that prevented Marie Curie from studying in Poland.[5]

The following report describes both the legal as well as social barriers, which women in Poland have had to overcome in order to gain access to the world of science. The first chapter presents a general outline of the history of the pioneering Polish suffragettes and the first women-scientists, taking into consideration their complicated political, cultural and economic situation, which shaped their lives. Poland's loss of independence brought about the first wave of the women's rights movement since aspirations for political freedom coincided with those for emancipation. Polish women were very determined to gain access to higher education and, during the interwar period, they took advantage (especially when compared to other European countries) of the chance to enter the world of the sciences. However, while enjoying this short period of favourable conditions, they did not manage to attain higher positions in the academic hierarchy; they mostly performed auxiliary functions at universities. Very rarely did they achieve the status of independent researchers.

The second chapter of the report deals with the years 1945-1989, when the equality of men and women was one of the main 'state principles.' The 'emancipation' imposed by Communist ideology brought about both benefits and threats to women in Poland. Higher education and the chance for a scientific career became widespread, but at the same time the division into 'male' and 'female' studies, research areas and jobs was strengthened, while the more prestigious positions and degrees remained mainly in the hands of men.

Chapter three concentrates on the current situation – from 1989 until today. The transformation has substantially altered the prospects and ambitions of Polish women and men. The educational level of the whole society has increased and the higher educational system has rapidly expanded. Simultaneously, old and forbiden traditions have came to the fore, together with the stereotypical perception of gender and resistance towards feminism, which have been erroneously associated with the Communist regime. The process of raising and educating young people has been saturated at all levels with stereotypical images of masculinity and femininity, which influence the way girls and women are perceived at school and work. In science, the tendency of previous periods has continued – the higher in the hierarchy, the fewer women. The less prestigious and less profitable public Research and Development Sector is open to women, while the private institutes have been dominated by men. Very slowly, Polish women have been entering scientific areas commonly regarded as 'male,' such as, for instance, the IT field. Also, participation in the European Commission Framework Programmes is lower for women than for men.

This report ends with recommendations, taking into consideration what the Enwise Expert Group advised in 2004. The entire work is supplemented with four anexes: a short presentation of an international research project carried out by the Women's Studies Centre of the University of Łódź, involving a group of male and female physicists; 2) a short essay on 'gender of the university'; 3) a description of the stormy history of the Women/Family/Equal Status plenipotentiary's office in Poland; and 4) information on the activities of non-governmental organisations for women in Poland.

When analysing the situation of women in science in Poland over a period of nearly two hundred years, one may notice a gradual progress. Nevertheless, there still exists inequality of women regarding promotion and careers. The European Commission pays much attention to these issues, while the decision-makers in Poland hardly notice them. Currently, this situation may be fraught with important consequences for Poland because the EC's objectives include internationalisation of the academic job market, creation of favourable conditions for promotion to the independent career of a researcher, as well as the development of common criteria for evaluation of research[6]. Of course, the issues mentioned above apply not only to women, but to all scientists. However, it should be borne in mind that the paths of scientific promotion are more difficult for women, for both objective reasons (they fulfill various social roles) as well those resulting from social stereotypes and conservative attitudes. Although the Ministry of Science and Higher Education is generally positive regarding changes proposed by the EC, these modifications cannot take place without the cooperation of all central bodies[7] which are responsible for science and higher education. If achieved, the beneficiaries of a modern, educational and research system in Poland will not only be open to women, but to all citizens.

For readers' convenience, Polish titles of references have been translated into English and placed within parenthesis.

Endnotes

1 A concise reflection on the subject may be found in the work of Sandra Harding; '*Women, Science, and Society', Science* (11) 1998 (September), vol. 281, no. 5383, pp. 1599–1600. Harding is a professor of pedagogy and women's studies at the University of California, Los Angeles, where she is the head of the Women Studies Center. She is the author and editor of ten books, mostly concerning the issues of science and gender. Her latest publication is entitled: *Is Science Multicultural? Postcolonialisms, Feminisms and Epistemologies* (Indiana University Press, Bloomington, IN, 1998).

2 The full name of the project: Stimulating Policy Debate on Women and Science Issues in Central Europe, Sixth Framework Programme, contract number: 36651, realisation period: 1.10.2006–30.09.2008.

3 At present, the unit is functioning under the name of *Scientific Culture and Gender Issues*.

4 http://www.nauka.gov.pl/mein/index.jsp?place=Lead08&news_cat_id=506&layout=2&page=psci&news_id=1244, 14.03.2007

5 From our perspective, it is also interesting how the profile of Skłodowska-Curie has been presented: the authors of the study devoted much space to her family, husband, daughter and son-in-law, which is justifiable as much as all of them also dealt with science and were Nobel Prize Laureates. However, in the text, we find sentences referring directly to the emotions of the woman-scientist: 'Desperate and lonely, after several days she started to write a diary, in which she directly addressed her late husband.' No other person from the pantheon of Polish science was so firmly situated within the family context; nor were private tragedies or personal experiences of the male scientists mentioned. This double Nobel Prize laureate, an outstanding representative of the world of science, has been, as all women in Poland, stereotypically assigned to the sphere of home, family and feelings.

6 All these postulates are included in the Green Paper on the European Research Area. They will be implemented in the EU member states during the EC Seventh Framework Programme, 2007-13.

7 Such as, for instance, conservative central evaluation bodies: Central Council of Higher Education and the Central Commission for Academic Degrees and Titles.

The Fight for State and Personal Independence:

Women and Science in Poland before World War I and in the Second Republic of Poland

Paulina Bunio

The inequality of access to education between women and men, according to researchers, appeared along with the institutionalisation of education. As long as the teaching process took place in homes and cloisters, women had equal chances to gain an education, or their chances were even better when compared to men. However, along with the appearance of universities and the formalisation of teaching (thirteenth to fifteenth centuries), women were deprived of this opportunity[1]. The struggle for women's access to education began in the Western world, including the Polish territories, divided at that time between three powerful neighbouring countries, in the **nineteenth century**. The process of emancipation of Polish women took place under very specific yet changeable and diverse conditions, depending on the historical and political situation. As Poles did not have an independent state of their own, each occupied territory exhibited a variation of characteristics, regarding, among others, the range of civil rights and liberties, the level of awareness and self-organisation, the degree of repression and the extent to which residents were subject to denationalisation[2]. Russification and Germanisation took place to a greater extent in the Polish Kingdom and Greater Poland respectively, compared to the citizens of Galicia, who enjoyed a relatively greater autonomy[3]. Although most conspicious in Prussia, a common feature of all three areas was social **conservatism**[4]. As for the legal system, the situation of women was similar everywhere: all the existing codes valid in the territories of Poland at that time (the Civil Code of Napoleon in the Polish Kingdom, the Habsburg Code of 1812 in Galicia and the German code of 1896 under Prussian rule) — **subjected a woman to a man**: the father, the husband, the nearest male relative[5] – depending on family and social relations. The emancipatory efforts of Polish women were inextricably linked to the struggle for state liberation. Women emphasised that their empowerment would also bring benefits to the whole nation and strengthen it in the fight for independence. Supporters of women's education also referred to the interest of the state: an educated woman who, after all, bore the responsibility of raising children, guaranteed continuation of Polish values, tradition, history and the mother tongue to future generations. Research on Polish emancipation movements has also shown that it was economics that prompted women to take a stance on issues[6]. The equality of rights, which manifested itself in access to education and work at the end of the nineteenth century, became nothing more than a necessity. The difficult circumstances of the period, such as the increased rate of mortality and deportations (exile) of men (a result of repression after the January Uprising of 1863-64), the economic crisis, the subsequent breakdown of land estates and industrialisation, which provoked mass migration to the cities, forced women to take on the role of bread-winners. They realised that education would improve their chances in the labour market.

Education of women became **one of the most important elements of emancipatory discourse** in the Polish territories during the nineteenth and early twentieth centuries. The first informal society of Polish suffragettes was *The Enthusiasts* (Entuzjastki). Their activity is dated between 1830 and 1850, under the leadership of Narcyza Żmichowska. They founded schools, conducted literary meetings, and wrote, edited and distributed illegal books and other publications, and they were involved in self – education. The aim of their activity was to improve the situation of women and for Poland to regain its independence. *The Enthusiasts* criticised the model of education of girls in the first half of the nineteenth century, which was restricted to foreign language learning (often only in the spoken form), drawing, dancing, singing and playing an instrument as well as being introduced to the basic elements of literature, history and geography in order to enable a woman to converse in society. *The Enthusiasts* expected something more from studying than only preparing for marriage, receiving guests and paying visits. They called for enabling women to have access to practical knowledge such as mathematics, which would make it possible to deal with household finances or gain specific vocational training.

Eliza Orzeszkowa, referred to as the pioneer of the women's movement in Poland[7], regarded the emancipation of women as a historical and social necessity; she presented her programme in 1870, in a publication entitled *Parę słów o kobietach (A Few Words about Women)*[8]. She stated that after 1864 (the failure of the January Uprising) the traditional pattern of a woman's activities (at home, with her husband and children) had become obsolete. Lonely women (widows, girls without dowry, divorcees), according to Orzeszkowa, should be able to look after themselves. In order to survive, they should study and work. Orzeszkowa insisted that the dissonance between the anachronistic way in which women had been taught and raised and be changed to better suit and the demands of the current reality: 'The time has come for female workers'[9]— she envisaged.

A literary illustration of Orzeszkowa's views on the emancipation of women was a novel, **Marta**, published by her in 1873. The protagonist, Marta Świcka, forced to support herself and her child after her husband's death, looks for a job. Due to lack of sufficient education, and under the pressure of established conventions, according to which certain occupations are appropriate for men only, she fails to find a well-paid position despite her determination. Instead, she becomes an ordinary needlewoman. However, she soon loses her job and, with her child, is destined to poverty, stealing and begging. She dies under the wheels of a horse-drawn tram, orphaning the youngster. The novel, in which the author calls for social reforms, and the necessity to prepare women for an independent life, was translated into 15 languages and became an international success. It also played an important role in the history of the women's emancipation movement.

Based on: Literatura Polska. Przewodnik Encyklopedyczny, (Polish Literature, The Encyclopedic Guide) vol 1, PWN, Warsaw 1984, p. 642.

Fighting for their rights, women would unite in formal, although not necessarily legal, structures. Under the patronage of Orzeszkowa and Maria Konopnicka, a secret organisation emerged, **Koło Kobiet Korony i Litwy** (**The Circle of Women of the Crown and Lithuania)**, which became active in the partitioned territories. At the beginning of the twentieth century, Polish suffragettes, Paulina Kuczalska-Reinschmit and Józefa Bojanowska, emphasizing women's necessity to obtain economic independence as the condition to gain full rights, established the **Związek Równouprawnienia Kobiet Polskich (Polish Women's Equal Rights Society)**[10] in Warsaw, which focused on the struggle for women's political rights.

Before women in the Polish territories gained the right to enter university, the most determined and ambitious ones went abroad, most often to Switzerland, France, England and Belgium, as well as North America. In the 1870s and 1880s, groups of Polish women appeared at universities in Zurich, Genoa and Paris. Those who returned to the country often achieved important positions in public and scientific life. Of course, studying abroad meant a huge financial effort, which many women paid for with years of subsequent poverty[11]. This decision was also an act of courage; claiming roles previously assigned exclusively to men, the first female students and researchers had to contradict the social conventions of the period. Various kinds of courses were organised in the Polish territories, which enabled one to receive higher education, yet all this had to be done clandestinely as it was semi-legal. Participants of these courses, together with the graduates of foreign universities, became the representatives of the first generation of educated Polish women.

A doctor, Adam Baraniecki, established **Wyższe Kursy dla Kobiet (Higher Level Courses for Women)** in Cracow. This course of study initially lasted for a year and was then extended to two years. Well-known professors of Cracow gymnasia and universities provided[12] lectures. In the years 1868 – 1924, 2,751 women[13] graduated from the program. In the years 1882-1883, a secret institution in Warsaw was established, called the **Flying** or **Women's University**. Its classes, conducted in secret from Russian authorities, were held in private flats in various parts of Warsaw. The 'Flying' university was launched by and for women in order to satisfy their educational needs, something already very much in demand at that time[14]. From among the five thousand women who participated in classes, future Polish university female students were recruited, among them Maria Skłodowska-Curie.

Maria Skłodowska-Curie (1867 – 1934), Polish physicist and chemist who worked in France. The first female professor at the Sorbonne, and co-founder of the science of radioactivity. The author of pioneer works in nuclear chemistry, and the co-discoverer of radium and polonium. Double Noble Prize laureate in 1903 in physics and 1911 in chemistry.

Source: The Popular Encyclopedia, PWN, Warsaw 1982, p. 712
Picture: http://historia_kobiet.w.interia.pl/teksty/sklodowska.html, 29.05.2007

The person responsible for turning many different scientific circles into the organised structure of a secret university was Jadwiga Szczawińska-Dawidowa. The governing board of the institution, which determined schedules, lectures and fees, consisted exclusively of women. Courses were conducted by well–known Warsaw professors and when the teaching level proved to be higher than at the Russified University of Warsaw (established in 1869), the secret university gained a large number of male students. The institution, which was legalised in 1906, continued to function with the name *Scientific Courses for Women*, under the auspices of the *Scientific Courses' Society*. After regaining the nation's independence, it became the Free Polish University.

The mass participation of women in informal or secret courses at the university level best testifies to their genuine demand for higher education. At the same time, women tried to obtain legal official access to systematic institutionalised university studies[15]. The ground was prepared by a debate in women's magazines, such as '*Bluszcz*' (Ivy), '*Świt*' (Dawn), '*Przedświt*' (Daybreak), '*Ster*' (The Steering Wheel), and '*Nowe Słowo*' (New Word)[16], as well as '*Niewiasta*' (Woman), '*Wianki*' (Garlands), '*Kalina*' (Viburnum), '*Dziennik Mód*' (The Daily Fashion), '*Mody*' (Fashions), and '*Wieniec*' (Wreath)[17]. In 1894, under the influence of Kazimiera Bujwidowa, who had for several years already been demanding the admission of women to higher education, sixty women applied to the Jagiellonian University (JU)[18]. **The applications were rejected**. However, three citizens of Warsaw, Stanisława Dowgiałło, Jadwiga Sikorska (later Klemensiewicz) and Janina Kosmowska, received an official approval of the University Senate to begin pharmaceutical classes with the status of visitors. A similar decision was made regarding five other women: Augusta Pasierbska, Stefania Deike, Jadwiga Dydyńska, Maria Mańkowska and Maria Arct[19]. In 1897, women in Austria, and therefore in Polish Galicia as well, were granted the right to study as ordinary students, which enabled them to obtain scientific degrees. In the same year, the first 'visitors' at the JU received the Master of Science degree[20]. However, not all faculties became instantly accessible to women. Law studies at Jagiellonian University were not available for women until 1919.

Among the students and graduates of Jagiellonian University, there were women interested in research work. In 1904, in response to the application of one JU professor, the Austrian Ministry of Education approved the appointment of women to the position of junior research assistants. However, two years later, a similar request of the JU Medical Faculty was rejected by Austrian authorities, who ordered the applicants to wait for a decision. This refusal motivated women students to petition for full rights for women at the university. In 1906, the JU Senate issued a declaration in which it stated its support for unlimited access of women to assistants' posts for women. The decision of the Austrian government, enabling the employment of women as assistants, came in 1907, but under conditions less favourable than those for men. In the years 1904-1918, 28 women worked at the university as assistants[21].

Thanks to the scientific ambitions of Polish women, their participation in courses at university level and their struggle to gain access to regular university studies, Poland, when it regained independence, already had a reserve of active, educated women, well-oriented in matters concerning the public sphere. In 1918, no one would seriously question granting the vote to women or their right to study and work at universities.

The first women's history researcher, so in a sense a precursor of women's studies in Poland, was Łucja Charewiczowa, PhD She was born in 1897 and studied history at Jan Kazimierz University in Lvov. In 1925, she defended her doctoral dissertation, and continued her studies in Paris, where she probably became acquinted with feminist thinking. In 1937, she obtained her habilitation degree (second doctorate) in Lvov. In her works, she tried to analyse the conditions that shaped contemporary women. She thought that writing the history of women was crucial both for them and for society. She authored the following monographs: Kobieta w dawnej Polsce (A Woman in Old Poland), Z przeszłości Lwowianek (From the Past of Lvov Women), Mieszczka lwowska w XVI w. (Townswoman of Lvov in the 16th Century), etc. She died in 1943 in the concentration camp at Oświęcim (Auschwitz).

Based on: A. Kusiak, Charewiczowa — inicjatorka badań nad przeszłością kobiet polskich, [w:] Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim, (Charewiczowa - The Initiator of Research on Women's Past, [in]: Woman and Culture: Women among the Intellectual Culture Creators in the Partition Period and the Independent State of Poland), A. Żarnowska, A. Szwarc et al., DiG Publishing, Warsaw 1996, p. 99–103

'… Back then, there was a dozen, at best, of us, girls, at the whole university... Girls at that time were not eager to take up studies, they preferred to wait for husbands' – recalls Irena Krzywicka, a student of Polish Philology at the University of Warsaw (UW) in the early 1990s[22]. Despite the writer's negative opinion as to the educational ambitions of young Polish women of the time, the percentage of them wanting to study and make use of the opportunity to learn during the interwar period in Poland was relatively high.

Table 1.1. Women as (a percentage of) university students in selected European countries

Country	Year of research	Of women (%)
Poland	1935/1936	**26.9**
Austria	1933/1934	18.7
Italy	1934/1935	14.0
Germany	1934	13.7
Great Britain	1934	23.8
USRR	1934	36.5

Source: M. Kondracka, Kobiety na uniwersytetach…, p. 283, bold – face by P.B.

The main goals of the Polish women's emancipation movement before the First World War were achieved in the newly independent state of Poland, established in 1918. This accomplishment represented the fulfilment of dreams of emancipation and was the result of the efforts of many Polish women and men. First of all, in accordance with the demands of the Polish suffragettes, Polish women gained their voting rights, one of the first countries in the history of Europe to do so[23]. New legislation granted men and women equal civil rights[24], while the professional activity of women ceased to provoke controversy (however, they usually continued to work in typically 'female' sectors of the economy for lower pay than men). The state declared equality of opportunity irrespective of gender, which was not, however, fully practised (for instance during the economic crisis of the 1930s, the law established that married women be made redundant first, as they were considered to be supported by men anyway[25]). Patterns of social behaviour changed slowly and at different rates, depending on the region. For example, the Poznan district would long remain a bastion of traditional cultural values: a patriarchal family pattern was dominant there[26], which obviously, as a consequence, hindered the educational and professional development of women.

In the restored Polish state, just after the end of the First World War, there were three universities: Jagiellonian University in Cracow, Jan Kazimierz University in Lvov, and Warsaw University, established at the time of Russia's withdrawal from Warsaw in 1915; at the same time, the Technical University was founded in the capital city, as well as the private Higher School of Commerce. Additional institutions of higher learning were created throughout the country at a fast pace.

In December 1918, the Catholic University of Lublin was established; in January 1919 Stefan Batory University in Vilnius and Adam Mickiewicz University in Poznan opened[27]. The development of the higher education system progressed quickly: in 1924 **24** universities already functioned, of which four were private[28], and by the end of the period under discussion, **28** functioned in Poland**[29]**. No university authorities denied women the right to study (at first their access to faculties of law was restricted, but soon reversed; at Jagiellonian University – the last one of all in this respect – in the 1919/20 academic year[30]).

During the partition period Polish women proved that they were determined, at any cost, to apply their qualifications and extend their competence through education. Since the second half of the nineteenth century, comprehensive schools for women had been catching up to those for boys, as far as programmes and academic levels were concerned. Women had played a significant role in the struggle to regain independence. Thanks to these factors, during the interwar period, the appearance of Polish women at universities was treated as a natural event and almost unquestioned, while the number of women students, assistants, doctors and professors, although disproportional to the number of men, was increasing.

An analysis of the available data makes it possible to state that women in Poland obtained access to lower levels of the academic hierarchy relatively easily. In the years 1918-1939, they constituted a significant percentage of students and **auxiliary research workers**[31]. Utterly different was their situation among contracted lecturers, senior research associates and, finally, among professors. The higher levels of an academic career proved to be almost inaccessible to women. Also, work in professions traditionally viewed as male, which theoretically should have been open to educated women, was not a common practice. In the interwar period, women constituted one third of intellectual workers and freelancers, much less than among physical labourers[32].

The percentage of women studying at Polish universities in the years 1918-1939 varied, similarly to the overall number of students. The economic crisis of the first half of the 1930s, higher fees for studies and the reorganisation of institutions caused a decrease in both the total number of students and of women among them. The highest percentage of women was noted in the academic year 1932/33: almost 29 % of all students. Most often, they would choose university studies in the humanities and medical sciences, as well as art schools. Already in 1923, Jagiellonian University restricted the proportion of women admitted to the Faculties of Medicine and Law to five percent[33]. The most feminised higher education institution, not only regarding the number of students but also as far as the employment of women is concerned, was the *Free University*[34], established on the basis of the *Flying University*, and the *Scientific Courses' Society*, where women traditionally participated in courses.

Women students during the interwar period definitely preferred areas of study within the humanities, and they dominated numerous faculties of this type, as the table below presents.

Table 1.2. Women studying humanities in the academic year 1934/1935

Higher education institution	Percentage of women students in general
Warsaw University	69.7
Vilnius University	66.7
Lvov University	65.4
Poznan University	54.9
Jagiellonian University	52.6

Source: M. Kondracka, Kobiety na uniwersytetach…, p. 274

The natural sciences come in second place. At the Faculty of Humanities of the *Scientific Courses Society,* women constituted 80 % of all students. At the Faculty of Natural Science, the percentage of women at the beginning of the period under discussion amounted to 75 % and decreased with time to 66 %. At Warsaw University, most women studied in the Faculty of Philosophy and the pharmacy branch of the Medical Faculty – 70 % of the total number of students. The area least interesting to women was veterinary medicine (three to five students of the total number). Women could not take any of the three theological majors at Warsaw University. As for Law, women's participation was low at first (3.6 %), but it gradually grew to a steady level of 15 to 20 %[35].

Women students were more financially dependent on their families than their male counterparts. Not many women combined studying with paid work and few of them received scholarships. Nevertheless, their financial situation was often better than that of men, since the majority of women who studied came from the intelligentsia, while male students came from all social classes, even less wealthy ones[36].

Women were less successful as students. They more often failed to get a diploma. For instance, at Warsaw University in the 1928/1929 academic year, women constituted 25 % of the graduates, despite the fact that their participation among all students was 38 %. In that year, a diploma was received by eleven percent of all male students and only by eight percent of all female ones. In the academic year 1934/1935, the above statistics showed little above thirteen percent for men (13.4%) and almost ten and a half percent for women (10.3%)[37].

Female university graduates often undertook jobs below their qualifications. They also received lower pay than men[38]. Law Faculty graduates were not admitted to work in the profession at all. A large proportion of women with university diplomas either forewent a job, or gave up working permanently, in order to start a family. Some treated this situation as an argument against women's access to higher education, regarding their studying as a financial waste. In 1925, during the inauguration ceremony of the academic year, the rector of Warsaw University questioned the sense of the presence of women in the classroom. He declared the effort to be too onerous for them, and at the same time an excessive economic burden for the state when taking into consideration the number of women who made use of their university training at the workplace[39].

The highest participation of women among all students was noted in Warsaw and Vilnius, as the table below shows. It is possible that other academic centres were more conservative and therefore made it even harder for women to enter.

Table 1.3. Women students in the academic year 1934–1935

University Centre	Students	Of women (%)
Warsaw	3,713	**39.4**
Cracow	1,885	28.1
Lvov	1,715	28.3
Poznan	1,435	27.3
Vilnius	1,135	**32.3**

Source: M. Kondracka, Kobiety na uniwersytetach…, p. 277, bold - face by P.B.

Women who lived outside university cities and wished to study encountered the simplest problems of a practical nature, such as the lack of dormitories. Due to social norms, renting a room to a single woman was a rarity. Women's dormitories emerged long after the first females appeared within university walls[40].

Despite the disappearance of formal legal obstacles, it was difficult for women graduates to build a scientific career. Academic society, especially its higher levels, did not prove well-disposed towards women. Hence, they took up work at universities as junior scientists: lecturers and research assistants and associates. Their percentage, however, did not grow in the period under discussion[41].

Table 1.4. Assistants at Jagiellonian University in the academic years 1925/1926 and 1935/1936

	1925/1926		1935/1936	
Faculty	Assistants	Of women (%)	Assistants	Of woman (%)
Philosophy	9	13.8	19	16.3
Medicine	13	14.6	11	14.3
Agriculture	6	20.03	7	17.9

Source: M. Kondracka, Kobiety na uniwersytetach…, p. 280

Readerships and professorships occupied by women were rare. Even in the much feminised humanistic faculties, the number of women academics did not correspond to the high percentage of students who were women. Among educated women, even those with doctorates, work in schools was a highly popular alternative, which provided prestige and financial security. Some female teachers wrote manuals, conducted research and worked both at school and university. Some female researchers, unable to obtain a satisfactory position at universities, which were dominated by men, engaged in research as freelancers[42].

The participation of women among doctoral students steadily increased; before 1918, Polish women obtained only 4.9 % of the doctorates awarded, in the 1920s 21.9 % and in the 1930s as high as 31.6 %[43]. Meanwhile, women rarely received habilitation degrees and professorships. Throughout the whole interwar period, 15 women obtained a habilitation at JU (the first one in 1920), and two obtained professorships (in 1929 and 1932)[44].

At UW, eight women were granted habilitations, and three obtained professorships[45]. In the 1930s, the promotion of women in the academy slowed down; university development stopped, departments were cut, and the number of higher level positions was frozen. Women, who had started to build careers in the sciences in the 1920s and were at last ready to aspire to higher positions, now found these posts already occupied by men.

Research careers influenced women's personal decisions. One third of them never married; they seldom had children. Also, one third had relationships with professors or other research workers[46]. In the interwar period the life of a woman working in science was not easy. Even if formally there were no restrictions against it, they still had to overcome social barriers and blaze trails in professional areas formerly utterly unknown to them. Promotion, especially to the highest academic positions, was so difficult that for the majority of women researchers it was impossible. However, to study and work in auxiliary research posts became popular among women during the interwar period, a good beginning for strengthening the position of women in Polish science in later decades.

Endnotes

1 M. Fuszara, Kobiety w polityce (Women in Politics), Trio, Warsaw 2006, p. 35

2 R. Siemieńska, Polacy i Polki w życiu publicznym — podobni czy różni od mieszkańców Unii Europejskiej, [w:] Aktorzy życia publicznego. Płeć jako czynnik różnicujący (Poles in Public Life – Similar or Different to the European Union Citizens, [in] The Actors of the Public Life. Gender As Differentiating Factor), R. Siemieńska et al., Wydawnictwo Naukowe Scholar, Warsaw 2003, p. 217.

3 M. Abram, Aktywizacja polityczna kobiet polskich na przełomie XIX i XX wieku, [w:] Humanistyka i płeć III. Publiczna przestrzeń kobiet. Obrazy dawne i nowe, (Political Activization of Polish Women at the Turn of the 19th and 20th Centuries, [in] Humanities and Gender III: Women's Public Space. Old And New Images) E. Pakszys, W. Heller et al., Poznan University Publishing House, Poznan 1999, pp. 81–82.

4 A. Dominiczak, Edukacja kobiet, [w:] Kobiety w Polsce 2003 (Education of Women [in] Women in Poland 2003). The Report of the Women's Rights Centre, Warsaw 2003, p. 89.

5 D. Mazurczak, Dążenia kobiet polskich do wyższego wykształcenia na przełomie XIX i XX wieku, [w:] Humanistyka i płeć, I: Studia kobiece z psychologii, filozofii i historii (Polish Women in Pursuit of Higher Education at the Turn of the 19th and 20th Centuries [in] Humanities and Gender I: Women's Studies in Psychology, Philosophy and History) J. Miluska, E. Pakszys et al., Poznan University Press, Poznan 1995, p. 181.

6 Ibid, p. 181

7 A. Górnicka-Boratyńska, Stańmy się sobą. Cztery projekty emancypacji (1863–1939) (Let's Become Ourselves. Four Projects of Emancipation (1863-1939), Świat Literacki, Izabelin 2001, p. 36.

8 Ibid, p. 46

9 Quote: A. Górnicka-Boratyńska, ibid, p. 47.

10 A. Górnicka-Boratyńska, Let's Become Ourselves…, p 16–17.

11 D. Mazurczak, Polish Women in Pursuit of Hugher Education…, pp. 187–188.

12 M. Kondracka, Kobiety na uniwersytetach, [w:] Równe prawa i nierówne szanse. Kobiety w Polsce międzywojennej. Zbiór studiów, (Women at Universities, [in] Equal Rights and Unequal Chances: Women in the Interwar Poland – a Collection of Studies), A. Żarnowska, A. Szwarc et al., The History Institute of the University of Warsaw, Warsaw 2000, p. 271.

13 D. Mazurczak, Polish Women in Pursuit of Higher Education…, p. 184.

14 M. Abram, Political Activization of Polish Women…, p. 83.

15 The submission of applications by women to study at the higher education level was possible only in Galicia, where two Polish universities functioned, in Cracow and Lvov. They formed the basis for Polish academic society, where people of Polish nationality were granted a wide range of rights, as compared to other parts of Poland under the rule of the other partitioners.

16 A. Górnicka-Boratyńska, Let's Become Ourselves…, p. 16.

17 Z. Sokół, Walka kobiet o wstęp na uniwersytety w Polsce (Womens' Struggle for University Admission in Poland), http://www.efka.org.pl/index.php?action=p_art&ID=6, 19.10.2004.

18 D. Mazurczak, Polish Women in Pursuit of Higher Education..., p. 190.
19 Z. Sokół, Womens' Struggle for...
20 D. Mazurczak, Polish Women in Pursuit of Higher Education…, pp. 190–191.
21 U. Perkowska, Kariery naukowe kobiet na Uniwersytecie Jagiellońskim w latach 1904–1939, [w:] Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim, (Womens' Research Careers at Jagiellonian University in the Years 1904-1939, [in:] Woman and Culture: Women among the Intellectual Culture Creators in the Paritition Period and in the Independent State of Poland) , A. Żarnowska, A. Szwarc et al., DiG Publishing, Warsaw 1996, pp. 140–142.
22 I. Krzywicka, Wyznania gorszycielki (Confessions of a Scandalist Person) ,Czytelnik, Warsaw 1995, p. 86.
23 Active and passive voting rights were granted to women in Poland in 1918. In 1921, restrictions concerning married women's ability to undertake legal action were abolished. In 1929, the rule of equality of spouses in private relations was introduced (A. Górnicka-Boratyńska, Let's Become Ourselves…, p. 12).
24 M. Pietrzak, Sytuacja prawna kobiet w Drugiej Rzeczpospolitej (Legal Situation of Women in the Second Republic of Poland), [in:] Equal Rights and Unequal Chances…, p. 81.
25 K. Sierakowska, Przegląd piśmiennictwa poświęconego dziejom kobiet w Polsce międzywojennej (An Overview of Written Works on the History of Women in Interwar Poland), [in:] Equal Rights and Unequal Chances …, p. 14.
26 R. Wapiński, Kobiety i życie publiczne — przemiany pokoleniowe (Women and Public Life – Generational Changes), [in:] Equal Rights and Unequal Chances…, p 29.
27 M. Kondracka, Women at Universities…, p. 273.
28 M. Wierzbicka, B. Jakubowska, Autorki i dzieła — kobiety w polskiej nauce historycznej w dwudziestoleciu międzywojennym (Female Authors and Their Works – Women in Polish Historical Science in the Interwar Period, [in:] Woman and Culture…), p. 75.
29 M. Kondracka, Women at Universities…, p. 283
30 Ibid, p. 273.
31 J. Halbersztadt, Kobiety w murach Uniwersytetu Warszawskiego 1915–1939 (Women within the Walls of Warsaw University), [in:] Woman and Culture…, p. 116.
32 M. Wierzbicka, B. Jakubowska, Female Authors and Their Works…, p. 75.
33 M. Kondracka, Women at Universities …, pp. 273–276.
34 M. Fuszara, Women in Politics…, p. 41.
35 J. Halbersztadt, Women within the Walls of..., pp. 109-111.
36 Ibid, p. 114.
37 Ibid, p. 113–115; see also: M. Kondracka, Women at Universities…, p. 275.
38 M. Kondracka, Women at Universities, p. 282.
39 J. Halbersztadt, Women within the Walls of…, pp. 111–112.
40 M. Kondracka, Women at Universities…, p. 278.
41 J. Halbersztadt, Women within the Walls of …, p. 118.
42 M. Wierzbicka, B. Jakubowska, Female Authors and Their Works…, pp. 77–78.
43 Ibid, p. 76.
44 U. Perkowska, The Scientific Careers of Women…, pp. 146–154.
45 M. Fuszara, Women in Politics…, pp. 42–43.
46 J. Halbersztadt, Women within the Walls of …, p. 126.

Simulated Equality or a Historic Chance? Women and Science in the Polish People's Republic (PRL)

Paulina Bunio

'One of the basic goals that a socialist state sets for itself is to assure the equality of all citizens, understood first and foremost as the equality of life opportunities[1]' — these words begin the preface to *Equality of Men and Women in the People's Republic of Poland*, by Roman Wieruszewski[2]. The equality of life opportunities was included in Article 66 of the Constitution of the Polish People's Republic, passed by the Parliament on July 22, 1952. It stated the following:

1. A woman in the Polish People's Republic has equal rights to a man in all areas of state, political, economic, social and cultural life.

***2. Equal rights of a woman** are guaranteed by:*

***1) equality with a man regarding the right to work and pay according to the rule 'equal pay for equal work',** the right to leisure time, social insurance, **education**, awards and distinctions, performing public functions,*

2) care for a mother and child, protection of a pregnant woman, paid leave both before and after delivery, maternity hospitals, day nurseries and kindergarten service and collective feeding facilities[3].

After amending the Constitution in 1976, the new provisions were included in Article 78, while Article 67, section 2, said:

The citizens of the Polish People's Republic have equal rights irrespective of gender, birth, education, profession, nationality, race, religion, or social situation and background[4].

One of the key **'systematic goals'** of the PRL was to improve the social position of women[5]. The goal was to be reached via education. The period of the PRL was characterised by the feminisation of secondary education. Attending comprehensive schools, which would naturally lead to university studies, was chosen by a much higher percentage of girls than boys[6].

Table 2.1. Comprehensive and vocational school graduates

School year	Gender	Comprehensive school graduates	Vocational school graduates
1965/1966	Girls	24.7%	47.7%
	Boys	10.5%	70.9%
1970/1971	Girls	24.7%	47.7%
	Boys	10.1%	79.5%

Source: R. Wieruszewski, Equality of Women and Men in the Polish People's Republic, p. 80

Paradoxically, despite the fact that girls outnumbered boys in comprehensive schools, the latter were more often admitted to universities. Analysis of recruitment results for first year male and female students in the years 1969/1970 and 1970/1971 shows that gender was the factor determining the opportunity study, either in the negative or positive sense. Women constituted a majority of those who passed the entrance exams, but were not admitted to the first year of studies. In the academic year 1969/1970, among people applying for admittance to the first year of studies in postgraduate Pedagogical Schools and Teacher Colleges, women constituted 78.8 % of the candidates and almost 83.4 % of those who passed the entrance exam with good results, but were rejected during the subsequent recruitment process. The same coefficients for universities were 68.3 and 68.7 % respectively; for Higher Schools of Economy – 66.7 and 68.9 %. Generally, in all types of higher education institutions women constituted 52 % of the candidates and as much as 62.3 % of those who had passed their exams, but were refused admittance[7].

Contrary to the mechanism described above, and in accordance with ideological guidelines in the Polish People's Republic, a constant and considerable growth of the number of women among all students took place. It was fastest in pedagogical and economic schools and at universities. In the years 1945-1973, women constituted on average 38.2 % of university graduates, while the proportion in 1973 doubled compared to 1945[8]. The data from 1980 document an over 50 percent-participation of women among all students (51.7 %). Two years later, women represented 53 % of all those educated at universities[9].

In several types of study, women most often chose the part-time - weekend - system over the regular, full-time, system, which came in second place. Also, extramural studies were popular among women. A relatively tiny percentage of women took evening studies.

Table 2.2. Women's participation in particular types of studies (%)

Year	Total	Regular studies	Evening studies	Part-time studies	Extramural studies
1960	36.7	42.3	5.9	28.9	24.9
1965	36.8	46.9	13.5	21.4	31.1
1970	41.6	49.5	19.3	34.0	31.3
1975	48.0	50.7	20.1	51.7	37.3
1980	51.7	54.0	21.1	53.0	45.0
1982	53.0	53.4	20.9	56.8	41.7

Based on: M. Bober-Pełzowska, B. Puchała, Changes in Women's Education Level, p. 79

Women's choices concerning the mode of study clearly suggest that they were heavily burdened with domestic duties. They were responsible for the household and children; therefore they could not participate in regular day-time classes. As the table shows, men constituted 80 % of evening students. Women often gave up regular daily studies and continued in the part-time extramural mode, after giving birth to children or starting professional work. Alternatively, they were getting married immediately after leaving secondary school and therefore started their university studies later, which also made it impossible for them to take up the regular daily studies mode[10].

In the Polish People's Republic, the **division into 'male' and 'female' majors** came to be marked very distinctly, and corresponded to the division of professions into which one entered. To the most 'feminised' professions belonged studies in pedagogical schools (over 78 % of women among the students), then medicine (67.8 %), economics (65.7 %) and lastly the traditional university (64.5 %). Women constituted more or less half of students in agricultural schools (46.9 %) and physical education academies (42.3 %). The lowest participation was noted in technical studies: 27.1 % (data from 1984). The popularity of the above majors with women corresponded to the professions into which they later entered; the largest number worked in education and pedagogy, healthcare, social assistance, librarianship and scientific information as well as administration (data from 1975–1984)[11].

Despite the constitutionally guaranteed equality of women and men regarding access to education, some universities introduced **limits restricting the number of female students** in particular majors. Medical academies applied the fifty-percent quota to both sexes[12]. This decision was unfair to women, who made up a majority of both applicants and those who passed the entrance exams. Agricultural schools restricted the number of female students to 25 %, which also did not correspond to the number wanting to study majors in this field[13].

In 1985, the Minister of Health and Social Security issued a regulation imposing a division of available places at medical universities according to the fifty-percent-rule for both men and women. The latter achieved better results during the entrance examination, but despite this could not be admitted if the limit of places assigned to women was exhausted. The ministry gave absurd reasons for the regulation, which, it argued, was a necessity: certain medical specialisations (for example: surgery) required psychophysical predispositions characteristic only to men; other majors (for example: radiology) constituted a threat to the procreational functions of women; twenty-four-hour care for patients would not let women perform their roles as mothers and family caretakers (sic!); male doctors were indispensable in case of war. In 1987, the president of the Supreme Administrative Court appealed to the Constitutional Tribunal. The latter declared the regulation contradictory to the Constitution and international conventions ratified by the state. The Tribunal also proved the lack of logic in the Ministry's reasoning[14].

The socialist regime had a full-employment policy. Its aim, the professional activisation of women, was achieved; the percentage of women employed was high and increasing. One should remember, however, that contrary to the legal requirements (constitutional declarations), women in the Polish People's Republic did not have working conditions comparable to those of men. A very clear distinction existed between traditionally 'male' and 'female' professions; women were offered lower positions and worse salaries. Analysis of the situation of women employed in the textile industry in Lodz in the 1960s shows that the educational level of women in all jobs was higher than that of men. Better qualifications, however, did not mean higher earnings for women, and when working in the same positions as men, women received lower salaries. Also, women had to put more effort into proving themselves more qualified than men[15]. As one person surveyed said: 'Women can't just be good, they have to be the best'. Vacancies in the Polish People's Republic were announced according to gender, which was very unfavourable to women. According to data from 1970, there were four vacancies for each man in search of employment, while there were as many as eight candidates for every vacancy for women. As a result, two different labour markets existed simultaneously: one for men and the other for women[16].

In the world of science and education, the mechanisms characteristic of the whole Polish labour market during the period under discussion were operative as well. The glass ceiling phenomenon was commonplace[17]. Women rarely managed to succeed in achieving the highest academic posts and degrees. The proportion of women employed at universities was smaller then the population of female students. At universities, **feminisation took place in the positions not connected to research.** Women were most often employed as lecturers and teachers, outnumbering men in these positions in the 1980s[18]. However, women were definitely less numerous among senior research associates and professors. Nevertheless, a slow but systematic growth of women among university employees in the area of academic teachers should be noted.

Table 2.3. Percentage of women among academic teachers

	1960/61	1965/66	1970/71	1974/75
Full Professors	5.5	5.1	6.6	6.7
Associate Professors	8.4	8.9	9.7	10.2
Senior Assistant Professors	14.4	15.3	13.2	14.5
Assistant Professors	22.1	28.2	32.8	33.4
Research Assistants	33.7	33.5	35.0	37.1
Lecturers	10.6	20.8	26.6	30.7
Other	42.7	51.8	54.8	63.2
Total	26.4	28.9	30.7	33.4

Source: Kobiety w Polsce, Główny Urząd Statystyczny, p. 41

The percentage of women among persons obtaining scientific titles and degrees increased every year. In 1960, women constituted 19.5 % of those who did their doctoral degrees. In 1970 it was 27.7 % and in 1980 – 32 %. The proportion of women obtaining habilitation degrees would long remain unchanged: 21.1 % in 1960, 20.7 % in 1970 and 21 % in 1980 (and through the whole decade). In 1960, 3.5 % of assistant professorships and 4.8 % of full ones belonged to women, while ten years later these figures were 7.3 % and 15.2 % respectively. In 1980, women obtained 13 % of all professorial posts awarded[19].

High participation of women was noted in scientific societies of various kinds. Women researchers were most strongly represented in natural science societies (from 23.1 to 77.5 % of participants), as well as those concerning the social sciences (from 12.4 to 75 %) and medicine (from 10.7 % among surgeons to 78.7 % among paediatricians). A remarkably smaller group of women belonged to technical and scientific circles (23.7 % in the Astronautical Society, 12.1 % in the Cybernetics Society, 4.6 % in the Society of Theoretical and Applied Electronics, and 3.9 % in the Theoretical Mechanics Society, data from 1974). Women researchers also received state awards for outstanding professional achievements. In the periods 1945-55 and 1964-74, women received a total of 99 such awards. The largest number of laureates was in the field of chemistry and light industry (17), agriculture, forestry and food industry (17) and social sciences (15)[20].

It was very rare for a woman to be among the highest authorities of the university. It was not until the late 1980s that a woman was appointed rector of a university. **The first woman** in Poland to become **rector** of a university **was** Professor Maria Joanna Radomska, the rector of the Jagiellonian University, 1981–1987[21].

During the period of the Polish People's Republic the position of Polish female researchers strengthened, which is proved by the figures. However, one should bear in mind the specific conditions in which the country found itself at that time. Science was strongly ideologised. The state supported research, but those who carried it out had no freedom of choice as to the subjects, methods and presentation of results. The state tried to introduce equality of men and women; it was not without relative success, if we bear in mind the dissemination of higher education and employment among women, as well as the creation of a comprehensive system of nurseries and kindergartens. Within this realm, a substantial part of the demands put forward by the second wave of feminism in the West were carried out in Poland. Nevertheless, the 'equal pay for equal work' rule still remained only a constitutional declaration. In the private sphere, convictions as to the traditional division of roles between the genders were still deeply rooted, which doomed employed women to working double time – both outside of the home and in the household. However, probably the most harmful factor from contemporary women's point of view has been the common opinion that the idea of gender equality was inseparably linked to the Communist regime, and as such it had to be discredited. This is where the label 'relic of the past period' comes from, as referred to in circles dealing with women's rights in Poland. Female researchers, as well as all women and representatives of other social groups in the Polish People's Republic, did not have the chance to express their true needs and views. This became possible only after 1989 with the fall of the socialist regime and the introduction of a democratic system.

Endnotes

1 Bold – face by the author.

2 R. Wieruszewski, *Równość kobiet i mężczyzn w Polsce Ludowej (Equality of Women and Men in the Polish People's Republic)*, Wydawnictwo Poznańskie, Poznan 1975, p. 5.

3 http://polskaludowa.com/dokumenty/prawne/konstytucja_1976.htm, 10.01.2005, bold by P. B.

4 Ibid.

5 M. Bober-Pełzowska, B. Puchała, *Zmiany w poziomie wykształcenia kobiet*, [w:] *Kobieta w Polsce. Referaty na światową konferencję Dekady Kobiet ONZ (Changes in Women's Education Level* [in:] *Woman in Poland. Referrals for the UN Decade for Women world conference*, Labour and Social Affairs Institute, Warsaw 1986, p. 60.

6 R. Wieruszewski, *Equality of Women and Men…*, p. 80.

7 Ibid, p. 90.

8 Ibid, pp. 88-89.

9 M. Bober-Pełzowska, B. Puchała, *Changes in Women's …*, p. 79.

10 Ibid, p. 64.

11 Ibid, p. 65.

12 R. Wieruszewski, *Equality of Women and Men…*, p. 95.

13 Ibid, p. 96.

14 M. Fuszara, *Women in Politics…*, pp. 52-53.

15 S. Dzięcielska-Machnikowska, J. Kulpińska, *Awans kobiety (Promotion of a Woman)*, Wydawnictwo Łódzkie, Łódź 1966, pp. 16–17.

16 J. Florczak-Bywalec, *Sytuacja kobiet na rynku pracy (The Situation of Women in the Labour Market)*, [in:] S. Dzięcielska-Machnikowska et al., *Kobieta w rozwijającym się społeczeństwie socjalistycznym (A Woman in a Developing Socialist Society)*, Wydawnictwo Łódzkie, Łódź 1975, p. 24, cf.: H. Domański, *Zadowolony niewolnik. Studium o nierównościach między mężczyznami i kobietami w Polsce (A Slave Contented: Analysis of Inequality between Men and Women in Poland)*, The Philosophy and Sociology Institute, Polish Academy of Sciences, Warsaw 1992, p. 5.

17 The glass ceiling phenomenon is described in more detail in a later part of this report.

18 Fuszara, *Women in Politics…*, p. 49.

19 *Woman in Poland*, The Main Statistical Office, Warsaw 1975, p. 22, cf.: M. Fuszara, *Women in Politics…*, p. 50.

20 *Woman in Poland*, The Main Statistical Office, Warsaw 1975, p. 41.

21 M. Fuszara, *Women in Politics…*, p. 50.

The Situation of Women in Poland – the Challenges of the System Transition Period of the 1990s

Chances of Career Development Resulting from the Accession of Poland to the European Union

Ewa Gabryelak

The political and economic transformation of the 1990s distinctively changed the viewpoint and aspirations of the generation entering adulthood at that time. A sociological survey, quoted by Andrzej Dominiczak, presents young people as practical as well as success- and career-oriented:

> *The teenagers of today perfectly understand the reality of the new system; its competitive character, the social and moral structure, based on the division into 'people of success' and 'losers', as well as the growing demand for professional and well-prepared employees*[1].

Rapid growth of the educational level among Poles continued beyond the end of the 1980s. Results from a survey carried out by the Main Statistical Office show that the percentage of persons with a higher education grew from 6.5 to 10.2 % in 2004. The number of students increased nearly five times, reaching the figure of two million. Also, the number of citizens with a secondary education rose – to 33 % of the population. The 1990s were also characterised by a distinctive differentiation in the education level, depending on the age group[2].

Still, traditional attitudes connected with the powerful position of the Catholic Church, the mainstay of the anti-Communist opposition and one of the driving forces behind its fall led in the beginning of the 1990s to the restoration of traditional gender-dependency, which in turn strengthened the already existent, deeply-rooted cultural stereotypes concerning gender roles. In the face of the new challenges linked to the shaping of the free market economy, especially increasing unemployment, the above factors were particularly unfavourable for girls. The imposition of traditional social roles on them, and, by no means a rarity in Poland, the phenomenon (described by Dominiczak and Siemieńska) of parents who, being forced by their mundane conditions to provide educational tuition to their son rather than their daughter, resulted from the conviction that higher education was of greater use to a man[3].

Another aspect of the difficult situation of women in Poland in the 1990s was the belief that liberal and progressive ideas, such as feminism, had been an invention of the Communists. This view, referring mostly to sexual liberalisation and the emancipation of women, was propagated, first and foremost, by right-wing and conservative political parties. The cutting edge of their criticism was also directed towards the educational (tuition) and professional (career) aspirations of women[4].

Women in Poland are better educated than men. In the following subchapters, data will be presented concerning this topic starting from primary school to the professoriate. Since the end of the 1980s, a general increase in the educational level in Poland may be observed. Enrolment in higher education has increased five times over the last fifteen years (1990-2005). This is partly the result of greater opportunity and easier access to academic institutions, including the possibility to study at private universities, which were non-existent before 1990[5]. At the same time, negative side effects can be noticed, such as inadequate financial resources, which have caused a decrease in quality as well as more disparate standards. Another obstacle to better quality of education has been the slow pace of academic staff growth, especially concerning those with the highest qualifications, as compared to the constant increase in the overall number of students[6].

Despite the fact that Poland is one of the signatories to the Convention on the Elimination of All Forms of Discrimination against Women[7], the majority of manuals used in primary schools in the 1990s did not stand up to the formal standards of the Convention. The Polish government of the time took no action to eliminate stereotypical social gender roles from educational materials. Both men and women were presented in a traditional manner: women usually dealing with household chores and taking care of the children, while men doing creative work, often pursuing their hobbies. The image of men was also much more attractive.

ARTICLE 5

States Entities shall take all appropriate measures:

a) to modify the social and cultural patterns of conduct of men and women, with a view to achieving the elimination of prejudices and customary and all other practices, which are based on the idea of the inferiority or the superiority of either of the sexes or on stereotyped roles for men and women;

b) to ensure that family education includes a proper understanding of maternity as a social function and the recognition of the common responsibility of men and women in the upbringing and development of their children, it being understood that the interest of the children is the primordial consideration in all cases.

Source: Viadrina International Law Project, http://www.vilp.de/Plpdf/p025.pdf, 31.05.2007

Poland also failed to adhere to regulations of the International Covenant on Economic, Social and Cultural Rights of the United Nations. The UN Committee on Economic, Social and Cultural Rights criticised the excessive influence of the Catholic Church both in the area of education and reproduction rights. In *Recommendations,* published in 1998 and based on a report concerning the implementation of the Covenant's regulations in Poland, the Committee criticised the stereotypical content of school manuals as well as the approach to sexual education and the tolerance of discriminatory practices during the admission procedure to some schools. The Committee also called on the government of Poland to assure gender equality in the areas of education and health care. Meanwhile, in December of the very same year, the government suspended the Action Plan for Women, raised the price of contraceptive devices by removing them from the list of refundable medicines, and withdrew the sexual education programme from schools.

In 1999, the educational system was thoroughly reformed. At the same time, according to Dominiczak and Jadwiga Wójcicka:

> *The Polish government is carrying out a policy strengthening the traditional stereotypical views on the social roles of women and men, encouraging women to abandon their educational aspirations for the sake of their families. Furthermore, contrary to the Covenant regulations quoted above, the Polish authorities tolerate discriminatory practices during the admittance of students to educational institutions*[8].

Despite the abovementioned obstacles, women constitute a clear majority of students at both the secondary and post–secondary levels. They also study longer than their male counterparts and fewer of them give up studying.

Table 3.1. Youth education: persons giving up further study

	Average age (tertiary education)		Percentage of youth studying		Percentage of school drop outs					
					total		men		women	
	1999	2004	2000	2005	2000	2005	2000	2005	2000	2005
EU-25	21.9	22.1	76.3	76.9	17.7	15.2	19.9	17.3	15.5	13.1
EU-15	22.0	22.2	73.5	74.1	19.5	17.2	21.8	19.5	17.2	14.9
The EURO area	21.8	22.0	72.5	73.1	20.1	18.1	22.8	20.7	17.5	15.5
Poland	**21.5**	**21.6**	**87.8**	**90.0**	**—**	**5.5**	**—**	**6.9**	**—**	**4.0**

Source: Europe in Figures — Eurostat yearbook 2006–07, EUROSTAT, p. 87, bold – face by E.G.

Among students 18 to 24 years of age, the number of girls giving up education is fifty percent lower than that of boys[9]. In Poland, the percentage of young people studying is more than 12 % higher than the average in the 25 countries of the European Union. The percentage of youths terminating their education is also lower than the EU average (both for the 'old' Community and the newly expanded one).

THE GLASS CEILING OF UNIVERSITIES— HOW DIFFICULT IT IS TO GET THROUGH

Since the end of the 1990s, the number of female university students has constantly grown. In 1999, it exceeded 60 % of all students. Enrolment of women increased in mathematics and the natural sciences. In the Communist period these disciplines were dominated by men. In a survey carried out for EUROSTAT in 2005, within the 25 to 64 age group, women constituted 48.3 % of mathematics and IT graduates, 16.5 % of civil engineering, and 67.1 % of other majors. Polish female graduates with mathematics and natural sciences-oriented majors have exceeded the average of the 25 countries of the EU by 10 %[10]. Women in Poland are most highly represented in the humanities, while in other scientific areas they constitute less than one fourth of the total number. In 2005, over 16 thousand women were doctoral students, the vast majority of them enrolled at state universities.

Table 3.2. Doctoral students, by type of studies, gender and institutions, 2005.

	Including				Type of studies					
					Regular			Extramural		
	Total	Women	Men	Foreig-ners	Total	Women	Men	Total	Women	Men
Total	32,725	**16,131**	16,594	424	23,169	**11,691**	11,478	9,556	**4,440**	5,116
State institutions	30,146	**15,051**	15,095	223	21,483	**11,042**	10,441	8,663	**4,009**	4,654
Private institutions	2,579	**1,080**	1,499	201	1,686	**649**	1,037	893	**431**	462

Higher education institutions	30,291	**14,930**	15,361	388	21,692	**10,878**	10,814	8,599	**4,052**	4,547
- State	27,712	**13,850**	13,862	187	20,006	**10,229**	9,777	7,706	**3,621**	4,085
- Private	2,579	**1,080**	1,499	201	1,686	**649**	1,037	893	**431**	462
Polish Academy of Sciences' research institutions	1680	**879**	801	24	1201	**653**	548	479	**226**	253
Research institutions (other than the Polish Academy of Sciences)	733	**311**	422	12	255	**149**	106	478	**162**	316
Medical Postgraduate Centre	21	**11**	10	—	21	**11**	10	—	**—**	—

Source: Science and Technology 2005, The Main Statistical Office, p. 239; data concerning men added by E. Gabryelak, bold – face by E.G.

Polish female students achieve better results in their studies than males, often graduating with honours. Throughout the decade 1995 to 2005, the number of women obtaining doctoral degrees increased four times, while the total of defended dissertations doubled.

Table 3.3. Habilitations and doctorates by gender and field of study, 2005

Field	Degree					
	Habilitations			Doctorates		
	Total	Men	Women	Total	Men	Women
In absolute numbers						
Total	955	611	**344**	5,917	2,986	**2,931**
Natural sciences	157	102	**55**	916	422	**494**
Technology	184	148	**36**	987	752	**235**
Medicine	146	95	**51**	1,325	567	**758**
Agriculture	102	68	**34**	510	223	**287**
Social sciences and humanities	366	198	**168**	2,179	1,022	**1,157**
Percentage (Fields)						
Total	100.0	64.0	**36.0**	100.0	50.0	**49.5**
Natural sciences	100.0	65.0	**35.0**	100.0	46.1	**53.9**
Technology	100.0	80.4	**19.6**	100.0	76.2	**23.8**
Medicine	100.0	65.1	**34.9**	100.0	42.8	**57.2**
Agriculture	100.0	66.7	**33.3**	100.0	43.7	**56.3**
Social sciences and humanities	100.0	54.1	**45.9**	100.0	46.9	**53.1**
Percentage (Gender)						
Total	100.0	100.0	**100.0**	100.0	100.0	**100.0**
Natural sciences	16.4	16.7	**16.0**	15.5	14.1	**16.9**
Technology	19.3	24.2	**10.5**	16.7	25.2	**8.0**
Medicine	15.3	15.5	**14.8**	22.4	19.0	**25.9**
Agriculture	10.7	11.1	**9.9**	8.6	7.5	**9.8**
Social sciences and humanities	38.3	32.4	**48.8**	36.8	34.2	**39.5**

Source: Science and Technology in 2005, The Main Statistical Office, p. 233, bold – face by E.G.

The vast majority of female researchers deal with social sciences and humanities (48.8 and 39.5 % respectively), but the higher in the academic hierarchy, the slower the increase in the number of women. This horizontal segregation is reflected by the table below. Although the number of women with habilitations or professorships increases, it is not very impressive as compared to those who obtain PhD degrees.

Table 3.4. Full professorships by gender, 1991-2005.

Specification	1991	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Men	77.6	83.3	78.0	77.0	75.9	76.5	76.3	75.0	72.9	73.2	73.5	73.0
Women	**22.4**	**16.7**	**22.0**	**23.0**	**24.1**	**23.5**	**23.7**	**25.0**	**27.1**	**26.8**	**26.5**	**27.0**

Source: Science and Technology in 2005, The Main Statistical Office, p. 235, bold – face by E.G.

However, since the beginning of the 1990s, one may notice a systematic growth in the number of women professors; the figure increased from 22.1 % in 1991 to 27.0 % in 2005. The percentage is highest in the medical sciences (the proportions between the number of professors of both sexes are, at the same time, the most balanced within this field), while in the social sciences and humanities men outnumber women.

Table 3.5. Full professorships by gender and field, 2005.

Field	Total	Men	Women
In absolute numbers			
Total	503	367	**136**
Natural sciences	116	84	**32**
Technology	82	74	**8**
Medicine	104	64	**40**
Agriculture	68	52	**16**
Social sciences and humanities	133	93	**40**
Percentage (Fields)			
Total	100.0	73.0	**27.0**
Natural sciences	100.0	72.4	**27.6**
Technology	100.0	90.2	**9.8**
Medicine	100.0	61.5	**38.5**
Agriculture	100.0	76.5	**23.5**
Social sciences and humanities	100.0	69.9	**30.1**
Percentage (Gender)			
Total	100.0	100.0	**100.0**
Natural sciences	23.1	22.9	**23.5**
Technology	16.3	20.2	**5.9**
Medicine	20.7	17.4	**29.4**
Agriculture	13.5	14.2	**11.8**
Social sciences and humanities	26.4	25.3	**29.4**

Source: Science and Technology in 2005, The Main Statistical Office, p. 235, bold – face by E.G.

GLASS CEILING — invisible barrier, discriminating against and preventing women and minorities from promotion.

STICKY FLOOR — the assignment of women to certain professional groups and consequently to lower earnings and prestige, without the possibility of promotion.

GLASS ESCALATOR — hidden male advantages for promotion even in traditionally female professions.

Source: One Hundred Words for Equality; A Glossary of Terms on Equality between Women and Men, European Communities, Luxembourg 1998

Despite the accessibility of data concerning the percentage of women professors and habilitation holders, it is hard to compare and estimate the barriers to women's academic career paths. For this reason, the *Glass Ceiling Index* has been designed.

GLASS CEILING INDEX (GCI) — is an indicator that measures the relative chance for women compared to men of reaching a top position. The formula for the Glass Ceiling Index is:

$$\mathbf{GCI = \frac{P}{Pa}}$$

P = proportion of women in grade A+B+C
Pa = proportion of women in grade A

A GCI of 1 indicates that there is no difference between women and men regarding promotion.

The higher the value the thicker the glass ceiling.

Grade **A** — Full Professor

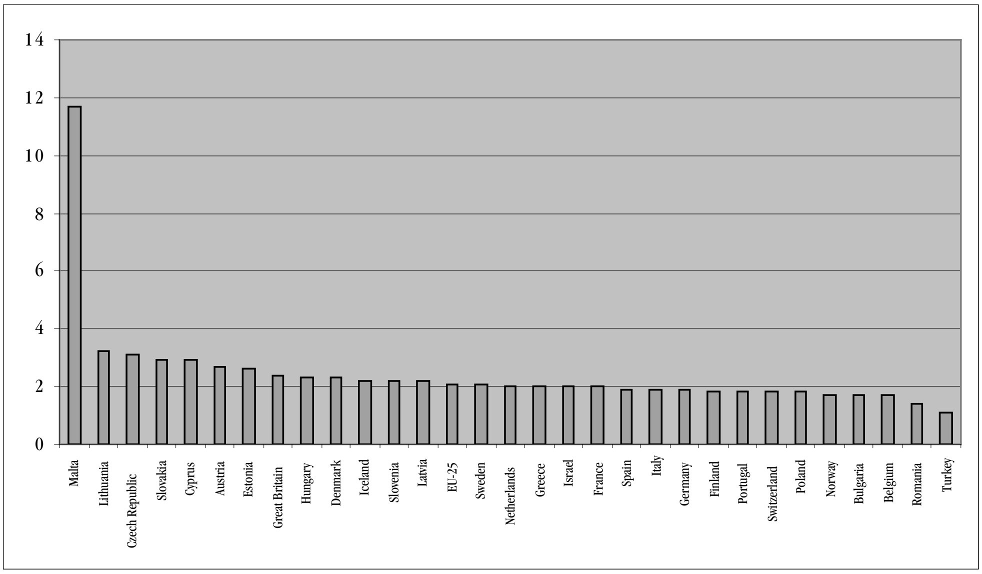
Grade **B** — Doctor with habilitation

Grade **C** — Doctor

Source: SheFigures 2006, EUROSTAT, p. 52, 101

On the basis of the number of women researchers in academia with a degree above the PhD, an analytical tool for a comparative analysis of different levels of women's education has been created. The percentage of women in 2004 at the A level (full professorship) amounted to 19.5 %, while level B (associate professor, doctor with habilitation) was 27.4 % and C (doctor) 41 %. The preceding data then served to design a tool enabling a comparative analysis of the glass ceiling's 'thickness' in the European Union member states. In research carried out in 2004, comprising the 25 countries of the Community, as well as those applying for accession at that time (Romania and Bulgaria) plus Iceland, Norway, Switzerland, Israel and Turkey – Poland came in sixth place with the figure of 1.8. This means that the glass ceiling in Poland is 'thinner' than the average (2.1) of the 25 member states of the European Union. Poland was in a group of 20 countries where the indicator is below two. One should remember, however, that although the result obtained in this research is favourable to Poland, the proportion between the number of women and men indicates underrepresentation of women in the sciences. This fact is especially significant if we bear in mind that the number of women employed at universities does not correspond to those with scientific degrees.

Figure 1. The Glass Ceiling Index in academic institiutions



Source: SheFigures 2006, EUROSTAT, p.59

Women researchers working at higher education institutions with full professorships constituted 10 % of academic staffs in 2004, while the percentage of men with the same title was 21 %[11]. Therefore, the disproportion between women and men in the higher education sector differs depending on the stage of career. Results of the research presented above show that Polish M.A./M.Sc. and PhD women students are the majority, but the further up the hierarchy the lower the representation of women. This disproportion becomes yet more visible when the posts of, for example, vice dean, dean and vice rector are examined.

Table 3.6. Managerial positions in HE institutions and RD units, by gender

Position	Total 2002	Women	Women (%)
Director	1,509	88	5.8
Dean	578	265	45.8
Manager	4,300	840	19.5
Vice-rector	362	52	14.4
Head of University Governing Body	328	20	6.1
Rector[12]	279	24	8.6

Source: Women and science: a review of situation in Poland, European Commission, p. 9

SCIENTIFIC CAREER AND EMPLOYMENT OF WOMEN: WORK IN THE GOV SECTOR VERSUS THE BES SECTOR

From 1998 to 2002, the percentage of persons employed at universities and in research institutions grew steadily. Research carried out in 2002 for EUROSTAT also shows the proportion of research workers employed in particular sectors – the goverment (GOV) and private (BES) one, mainly in the business area. From among 90 842 scientists, as many as 56 745 had full-time positions. Unfortunately, the investigation did not include gender distinction. However, the general tendency is visible with regard to the increase of women employed in this sector. In 2002, almost 10 % of researchers had positions in the business area, another 25 % in the GOV sector, while the remaining group (65 %) worked at universities. **Researchers in the GOV sector** were found mainly in technology and engineering (36 %), natural sciences (30 %), agriculture (13 %), medicine (12 %), humanities (6 %) and social sciences (3 %), while **academic scientists** focused on the humanities (24 %), engineering (21 %), natural sciences (20 %), medicine (15 %), social sciences (11 %) and agriculture (8 %)[13].

The survey carried out by EUROSTAT in 2004 in the 25 countries of the European Union shows that Poland has one of the highest numbers of doctoral students affiliated with the GOV sector. The most frequently chosen field of science was medicine (54 %), then agriculture (47 %) and the humanities, as well as social sciences (46 %), while the least popular among women scientists proved to be the natural sciences (20 %)[14].

Research conducted by the Main Statistical Office in the years 1995, 2000 and 2005, concerning the employment of women and men in the scientific sector, indicates a constant although slow increase in the employment of women: in 2000, as compared to 1995, it amounted to about three percent. Unfortunately, there is no detailed data regarding the gender factor. Most Polish women scientists are employed in the GOV sector.

Table 3.7. Number of R&D personnel in GOV by occupation and gender, (2003)

Country	Researchers		Technicians		Other	
	Women	Men	Women	Men	Women	Men
Austria	820	1,548	661	664	1,263	1,054
Belgium	648	1,525	496	750	174	310
Cyprus	87	130	96	164	120	127
Czech Republic	2,611	5,386	2,038	1,286	1,183	853
Denmark	1,143	2,130	1,136	609	-	-
Estonia	379	258	117	46	241	104
Greece	1,176	1,851	839	1,111	1,638	2,533
Spain	9,548	11,919	3,766	3,006	3,443	3,624
Netherlands	2,130	6,414	1,070	3,309	1,001	1,942
Ireland	204	462	155	432	210	194
Lithuania	874	862	617	209	389	350
Luxembourg	104	261	27	45	78	33
Latvia	366	294	119	83	342	268
Malta	2	7	1	8	5	14
Germany	11,895	32,040	4,632	5,077	17,359	13,693
Poland	**6,150**	**8,814**	**2,976**	**2,424**	**3,267**	**1,759**
Portugal	2,909	2,118	615	498	673	460
Slovakia	1,286	1,558	747	293	386	188
Slovenia	803	1,053	301	243	190	103
Hungary	2,323	3,499	1,530	829	2,009	1,284
Great Britain	3,225	6,787	1,678	3,509	3,861	3,734
Italy	6,721	10,668	6,662	8,707	5,652	4,200
Bulgaria	3,235	3,142	1,924	958	1164	554

Iceland	430	592	234	188	173	123
Japan	4,233	3,2035	4,101	5,405	10,711	15,882
Norway	1,540	2,790	1,103	1,209	—	—
Romania	3,083	3,187	1,195	852	769	555
Switzerland	231	753	131	185	205	128
Turkey	1,047	2,757	230	1,053	758	2,799

Source: SheFigures 2006, EUROSTAT, p. 90, bold – face by E.G.

Symptomatically, in this sector **the expenditure *per capita* is the lowest, while at the same time the percentage of women is relatively high.** Poland, with a comparably large proportion of women scientists working in the GOV sector, exceeding significantly the average of the 25 EU member states, is at the same time one of the countries with the lowest financial outlay per researcher.

Table 3.8. Proportion of women researchers and R&D expenditure, 2003

Country	Women (%)	Expenditure *per capita* (EUR)
Latvia	53	4,500
Estonia	43	5,000
Lithuania	48	5,000
Slovakia	41	5,000
Poland	**39**	**5,000**
Romania	43	5,000
Bulgaria	47	5,000
Portugal	44	11,000
Turkey	36	10,000
Hungary	35	12,000
Cyprus	31	12,000
Greece	37	12,000
Spain	36	18,000
Czech Republic	28	18,000
Iceland	35	18,500
Norway	29	20,000
Slovenia	34	20,000
Ireland	31	24,000
Finland	30	25,000
Denmark	28	30,000
Austria	21	31,500
Japan	12	35,000
Sweden	36	36,000
Germany	19	37,000
EU-25	29	39,000
France	28	40,000
Italy	29	42,000
Switzerland	21	44,000
Netherlands	17	48,000
Luxembourg	17	53,000

Source: SheFigures 2006, EUROSTAT, p. 72, bold – face by E.G.

The financial resources in the R&D sector in 2003 came from three main sources. The highest was government expenditure amounting to 67 %. Financing from industry resources was 28 % of the whole sum, while foreign monies (mainly connected with the participation of R&D institutions in international research projects) came to five percent[15]. Therefore, **it seems necessary to apply for additional funding**. The efforts and success of female scientists in soliciting research grants were the subject of an analysis carried out in 2006. From among 26 countries in question, 17 of them 'favour' men in this respect. Poland is one of them. The difference in the percentage of scholarships granted is 4.6 % to the advantage of men. One should remember, however, that women constitute a minority in subsidised research areas. The results showing favouritism toward one of the sexes in the distribution of research grants are based solely on applications received. The number of female students and researchers who do not apply for funds remains unknown[16].

One form of potential research funding is provided by EU Framework Programmes. In a report assessing the participation of Polish scientists in Framework Programmes, Andrzej Siemaszko and Jerzy Supel write that in comparison to countries of similar research potential (e.g. the Czech Republic, Hungary, Austria), the participation of Poland in the Fourth Framework Program and in the first two years of the Fifth Framework Programme was modest. However, a comparison of Polish researchers participation in the Fifth and Sixth Framework Programmes reveals a significant growth in the number of participants – the biggest of all member states (83 %). Also, the percentage of the financial share in the FP6 is significant in the case of Poland: it increased by 15 after FP5 was introduced[17].

The participation of women researchers working as experts and evaluators in FP5 and FP6 increased. In FP5 the participation of women experts was 24 %, while it was 28 % in FP6. The above figures, however, are still below the desired level of 40 %[18].

Table 3.9. Polish women experts registered in Exsis and women evaluators, 1999–2002

Exsis experts (HC)	Women	Women (%)	Acting experts	Women	Women (%)
641	157	24%	225	61	27%

Source: Waste of Talents: Turning Private Struggles into a Public Issue. Women and Science in the Enwise Countries, European Communities 2004, p. 100

Table 3.10. Polish women experts, acting experts, advisory group members, 2004

Experts (HC)	Women	Women (%)	Acting experts	Women (HC)	Women (%)	Advisory group members	Women	Women (%)	Programme Committee members	Women	Women (%)
1083	308	28%	143	43	30 %	7	1	14%	50	17	34%

Source: Women and Science. Excellence and Innovation — Gender Equality in Science, Luxembourg 2005, p. 24

The careers of researchers in the BES sector take a slightly different course. A survey by EUROSTAT from 2003 reveals that as much as 57 % of male and female scientists working in the BES sector is employed in middle sized companies (from 50 to 499 workers). The representation of women in the BES sector is not significant; in 2003, the figure was 25.2 %, while in the GOV sector women constituted 41.1 % of the employees, and in higher education the figure was 40.5 %[19].

Table 3.11. R&D personnel in the BES sector, 2003

Country	**Researchers**		**Technicians**		**Other**	
	Women	Men	Women	Men	Women	Men
Austria	2,012	17,383	2,026	9,293	1,058	2,248
Belgium	3,838	17,191	3,141	10,385	2,030	5,087
Bulgaria	658	727	365	360	172	116
Cyprus	57	199	45	134	89	43
Czech Republic	2,030	8,387	2,754	7,172	1,606	2,173
Denmark	4,821	14,365	5,529	7,669	2,361	2,207
Estonia	226	727	131	179	152	114
Greece	909	3,466	919	5,111	1,390	1,304
Spain	9,080	25,025	7,801	24,309	5,419	10,692
Netherlands	2,125	22,404	2,758	19,961	2,083	8,111
Ireland	1,341	5,270	574	2,225	755	1,872
Iceland	420	854	183	344	156	236
Japan	32,596	465,024	15,018	45,663	26,538	68,540
Lithuania	187	325	96	71	96	33
Latvia	379	323	80	143	178	125
Germany	20,205	151,014	21,870	60,864	22,177	62,065
Norway	2,866	12,288	1,896	5,522	—	—
Poland	**3,332**	**8,464**	**2,718**	**4,088**	**2,369**	**3,136**
Portugal	1,811	4,291	568	1,900	430	882
Romania	4,215	5,871	1,572	1,235	1,840	2,499
Slovakia	696	1,559	567	886	403	434

Slovenia	569	1,443	1,043	1,964	278	379
Switzerland	2,845	14,365	3,310	15,440	2,195	4,075
Turkey	1,320	3,957	442	2,003	301	1,084
Hungary	1,348	4,151	1,442	1,134	604	759
Italy	6,110	25,937	4,887	32,606	3,860	12,287

Source: SheFigures 2006, EUROSTAT, p. 91, bold – face by E.G.

PROGNOSES AND RECOMMENDATIONS FOR THE FUTURE

Economic growth as well as a decrease in unemployment and rising living standards are not possible without the impovement of the quality of the higher educational system. Solutions, first of all, should begin with research on educational efficiency and labour market demands, which would enable the creation of effective management models. The aspirations of young people versus the slow growth of academic staff is a significant problem in Poland. The Lisbon Strategy and *The Role of Universities in the Europe of Knowledge,* a document prepared within the confines of the Bologna Process[20], set such goals as: providing high quality education, ensuring close cooperation of higher education institutions with the economic sector (especially the high-tech industry), and international cooperation in the academic environment, as well as student and academic staff mobility. A low figure of women's employment in the IT sector is connected partly to their education and competence. However, cultural stereotypes concerning traditionally 'male' and 'female' occupations, which still linger in Polish society, are not without significance, as they often lead to women's real qualifications being unnoticed. Therefore, pursuing gender equality is necessary in occupations dealing with science and technology, something to be accomplished via proper legislation and a simultaneous promotion of women's scientific achievements. This should be done first and foremost for the sake of justice. If science also applies to women, especially in the sphere of reproductive health, it is highly ethical to enable them to control the development and implementation of research, which significantly influences their lives and concerns them directly. Therefore, they should be researchers as well as objects of the research itself. Second, a higher number of scientifically active women considerably improves the credibility of research, because of multiplied perspectives. At the same time, higher participation of women in this sector would reduce occupational segregation and positively improve the efficiency of the labour market[21]. A third and by no means less important argument supporting greater participation of women, especially in the fields of mathematics, the natural sciences and technology, is that over the next decade an estimated almost one third of European researchers will retire, thus providing many opportunities for women, who are particularly underrepresented, mainly in the higher positions. The objective of the 'Women and Science' initiative is to encourage women's participation in scientific research in the member states by levelling obstacles to their progress[22].

Similar arguments are used by the authors of the Enwise report. In the summary, they included recommendations addressed to the Cabinet, the European Parliament, the European Commission, state R&D policy makers, higher education institutions, research centres, the business community, the media and female scientists themselves. Some of the postulates in the report are already being implemented. Gender equality has been strongly emphasized in the FP6. Gender mainstreaming is also one of the key demands in the FP7 in order to achieve greater competitiveness and integrity, both social and economic. The Committee on Women's Rights and Gender Equality asserts that in order to make the most of EU scientific potential in 2010, about six to seven hundred thousand new scientists should be trained. Therefore, the European Commission has proposed to double the budget of the FP7 as compared to the FP6. This step is taken in order to attract young scientists, especially women, to areas in which they are underrepresented. The Women's Rights and Gender Equality Committee has therefore demanded the implementation of the gender equality policy found in FP7, *inter alia* by providing equal opportunities to women scientists or even via positive discrimination, e.g. when grants for young scientists are awarded[23]. This is why gender mainstreaming should be reflected in research, in technological development and in the process of propagating FP7[24].

The National Contact Points in Poland and the Ministry of Science and Higher Education, have a well–developed IT system. They provide all the essentials about the EU Framework Programmes. The website of the Ministry has a built-in section devoted to women in science, containing state and EU statistics, as well as links to documents and analyses of the European Commission. The National Contact Point publishes analyses of Community funds utilised by Polish scientists. It also functions as an advisory centre, and provides information about workshops and seminars, including those for female scientists, organised, for example, by the 'Women in Science' Centre of Excellence. Another postulate of the Enwise Expert Group – already fulfilled – was an increase in the number of female scientists taking active part in the work of advisory groups. A comparison of the figures concerning the number of experts in the 5th and 6th Framework Programmes shows a significant growth: two percent in Lithuania, four percent in Poland, five percent in the Czech Republic and in Slovakia, seven percent in Hungary, and ten percent in Estonia. Two countries from the Enwise Group have also registered a fall in the number of experts – Latvia by one percent and Slovenia by two percent; Romania and Bulgaria were not included in the *Women and Science. Excellence and Innovation — Gender Equality in Science* analysis[25].

An answer to the recommendations of the Enwise Report is also the European Platform of Women Scientists (EPWS), established in 2005, and financed from the resources of FP6 Specific Support Action. It works to benefit women researchers' societies and networks. Its basic task is to support already existing groups and to facilitate contacts among European women scientists. The EWPS runs an on-line newsletter and organises conferences and trainings. It is also involved in the propagation of gender equality in the scientific research area, and functions as a bridge between female researchers and R&D policy makers. The main focus of EWPS is the cooperation of Central and Eastern Europe women researchers, as well as of those employed in the BES sector[26].

Endnotes

1 A. Domińczak, Edukacja Kobiet, [w:] Kobiety w Polsce w latach 90. (Education of Women [in:] Women In Poland In the 1990s.), Report of the Women's Rights' Centre, Warsaw 2003, pp.87-88.

2 *Human Resources Operational Programme. National Cohesion Strategy, 2007–2013,* a document accepted by the Cabinet; Ministry of Regional Development, Warsaw 2006, pp. 29–30.

3 A survey conducted in the years 1995–1997 shows that 70 % of Poles agree that higher education is more useful to men than to women; at the same time, in research conducted simultaneously by A. Domański, 40 % of female respondents stated that it is more convenient if a man is a breadwinner and a woman remains a caretaker.

4 A. Dominiczak, *Edukacja Kobiet*, [w:] *Kobiety w Polsce w latach 90*. (*Education of Women [in:] Women in Poland in the 1900s*.), report of the Women's Rights' Centre, Warsaw 2003, pp. 91–92.

5 As the Main Statistical Office figures show, in the academic year 2004-2005, almost one third of students attended non-public universities. This is caused by greater accessibility to such universities, which are also situated in smaller cities.

6 G*ender Equality Policy in Practice, The Manual*, UNDP, Warsaw 2006, pp. 68–75.

7 The Convention on the Elimination of All Forms of Discrimination against Women was accepted by the UN General Assembly on December 18, 1979, then ratified by the State Council of the Polish People's Republic, and came into force in 1982; http://www.vilp.de/Plpdf/p025.pdf, 31.05.2007

8 A. Dominiczak, *Education of Women [in:] Women in Poland in the 1900s*., report of the Women's Rights' Centre, Warsaw 2003, p. 94.

9 *Education* [in:] *Europe in Figures — Eurostat Yearbook 2006–07*, Brussels, 2007, pp. 84–87.

10 H. Wilén, '*Science Graduates Are Younger and Better Employed'*, [in:] *Statistics in Focus. Science and Technology*, Brussels 2006.

11 *SheFigures 2006*, EUROSTAT, pp. 57-58.

12 Presented data concern both the function of a rector and a prorector of public HE institutions. The comparisons for the ENWISE group of countries are available in Enwise Report, p. 59.

13 S. Frank, '*R&D personnel in the EU'*, [in:] *Statistics in Focus: Science and Technology*, Brussels 2005.

14 H. Wilén, '*R&D in High Education and Government'*, [in:] *Statistics in Focus. Science and Technology*, Brussels 2007.

15 '*Science and Technology'*, [in:] *Europe in Figures — Eurostat Yearbook 2006–07*, Brussels 2007, p. 252.

16 *SheFigures 2006*, European Comission, Luxembourg 2006, pp. 66, 70.

17 *Ocena udziału Polski w Programach Ramowych UE* (*Assessment of Poland's Participation in EU Framework Programmes*), National Contact Point for EU Framework Programmes 2007, www.6pr.pl/statystyki/udzial_pl.html, 31.05.2007.

18 *Women and Science. Excellence and Innovation — Gender Equality in Science*, Luxembourg 2005, p. 23.

19 S. Frank, '*R&D personnel'* [in:] *Statistics in Focus. Science and Technology*, Brussels 2005.

20 *The Role of Universities in the Europe of Knowledge*, European Commision, 2003.

21 Ibid, pp. 68-75, 110-111; *Human Resources Operational Programme. National Cohesion Strategy 2007–2013,* a document accepted by the Cabinet; Ministry of Regional Development, Warsaw 2006, pp. 29-31.

22 *The Role of Universities in the Europe of Knowledge*, http://www.menis.gov.pl/wspolpraca/unia_europejska/rolauniw.php, 21.03.2007.

23 Many grants have age limits of 30–35 years, excluding researchers who, as surveys show, most often are on maternity leave at that time or are looking after small children. *Report on the Application Concerning the European Parliament and Council's Decision on the European Commission 7th Framework Programme for Research, Technological Development and Demonstration Activity, 2007–2013*, http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A6-2006-0202+0+DOC+WORD+V0//PL, 30.03.2007.

24 http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A6-2006-0202+0+DOC+WORD+V0//PL, 30.03.2007.

25 *Waste of Talents: Turning Private Struggles into a Public Issue: Women and Science in the Enwise Countries*, European Communities 2004, p. 100; *Women and Science: Excellence and Innovation — Gender Equality in Science*, Luxembourg 2005, p. 24.

26 More information on EPWS activity is available at http://www.epws.org.

Annexes

WOMEN IN PHYSICS

Patrycja Chudzicka-Dudzik, Anna Diekmann, Małgorzata Miazek

A lack of interest in science is currently a tendency observed all over Europe, including Poland, and one reflected by the difficult situation concerning research staff in this field. Existing reports, such as the *Enwise Report* or *She Figures*, show that the problem mainly concerns women, who are not only insufficiently encouraged to take up scientific work, but abandon it at various stages of their careers. It appears that the cultural context is of significance here. Therefore, this observation became the starting point for an analysis of the above phenomenon in a European Commission project, with the acronym UPGEM (Understanding Puzzles in the Gendered European Map), in which the career paths of women and men in physics were examined. The study involves universities from five countries: Poland, Estonia, Denmark, Finland and Italy. The main part of the inquiry was based on interviews with physicists, both active and inactive.

A preliminary analysis shows that Polish culture, to a large extent, determines the career path of women physicists. It shapes not only social and occupational expectations towards women, but also their own perception of themselves and their abilities. It is remarkable that at various stages of an academic career different cultural factors become meaningful.

The socialisation process and acceptance (or rejection) of physics as field of study by the family are the most determinant factors for choosing it as a career path. Also, encouragement received from teachers is crucial in arousing students' interest in this scientific area. Due to stereotypical thinking about science, however, women are often discouraged from studying physics and subsequently making a career in this specialisation.

At the stage of developing a career, family issues become increasingly important for women, and consequently the same applies to reconciliation of professional work with household duties. The situation of women at universities and research institutes is even more difficult, inasmuch as their structures offer only limited flexibility for dealing with important issues to women such as maternity or parental leave. These leaves are a natural break in one's research career, but they are not taken into account in the general evaluation of a worker's performance. Other factors negatively affecting the position of women in physics are the outdated regulations concerning promotion and recognition, which often mean the denial of women researchers' achievements.

Obstacles facing women on their way to a successful research career contribute to their frequent abandonment of the field. Consequently, there is an underrepresentation of women in the highest academic positions. This situation is not improved by the all too frequent lack of support of those women who have already achieved success and could very well become mentors for lower-level women.

Despite the fact that Polish culture and the resulting science shaped by it seem to be unfavourable toward women's careers in physics, there are still examples testifying to the fact that under the right conditions some women do achieve success and make use of their scientific potential in a way that brings them satisfaction. This fact allows one to hope that in the future more Polish women will not only decide to take up research work, but also obtain higher academic positions.

'GENDER OF THE UNIVERSITY'
Iza Desperak

Having spent over a dozen years at university, as a master's and doctoral degree student, an assistant, and eventually a senior lecturer, I wish to attempt to outline the basic mechanisms differentiating people by gender.

All educational institutions copy the dual standard ascribed to gender – girls at primary school learn within the 'hidden school curriculum' not so much to be bright as to complete their homework, care for the cleanliness of their notebooks and blackboard, and to water the flowers in the classroom. Boys may throw the sponge around, push one another, carry notebooks the look and content of which leave a lot to be desired, but it is they that a mathematics or physics woman teacher would address in the first place. Paradoxically, the stereotypical view that girls are less talented in the sciences has been modified in Poland in a particular way. Girls are seen as less capable in the area of physics, mathematics and the technical sciences, while at the same time viewed as gifted in other scientific fields, such as biology and chemistry. This is certainly connected with the feminisation of such jobs as nurse, doctor and laboratory assistant. Even as early as during the Polish People's Republic, resistance to the feminisation of medical studies took the form of granting male candidates additional points on the entrance exam.

Female secondary school graduates brought up in the dual standard become university students who stay silent during classes unless called upon, while in the oral exam, they begin their answer to the question with 'well, I'm not sure', even when they are very well prepared. At the same time, their male colleagues shine in class and take part in the discussion, not thinking whether their reflections are of value, while during the exam they answer in a confident manner, beginning with 'of course'. Only recently have women constituted the majority of students, and still their predispositions or motivation for studying are questioned. Lecturers addressing women use a full array of expressions, such as 'long hair, short brain', implying that they came to university to find a husband. They even openly suggest that women should switch their interests to cookbooks. Another mechanism scarring female students is that they are perceived in sexual categories, or even as sexual objects. Along with remarks concerning their physical appearance, one may encounter offers of 'grade for sex', something frequently accepted by both parties. One of my colleagues has been frequently rumoured to be sleeping with his students; another one shamelessly showed me a scheme in which, during the entrance exam, he calculated 'points' based on candidates' looks. The acceptance of such practises is further substantiated by the story of a group of students who 'provided' a girl to 'date' a lecturer in exchange for his taking a favourable stance toward them in class.

Women students who stay at the university to continue their careers have undergone this dual-standard-training, and they know that what is expected of them is accuracy, order, diligence, reliability, and of course, hard work. Their male colleagues have to work hard as well, but they are required to demonstrate brightness and representative looks, instead of scrupulous accuracy. The rules of the game learned by heart during studies teach us not to react to instances of sexist behaviour of supervisors or advisers. Despite general disgust during the defence of the doctorate, we accept that the adviser will talk not only about the value of our dissertation, but also about the length of our legs. What women do is of secondary importance, while tolerance for unequal treatment is the price that must be pain to enter the temple of knowledge.

Even in the fields of science where women's presence is not a surprise – they are professors, department chairpersons, senate members – women researchers are treated according to these dual standards. They are often mistaken by first-year students for secretaries or workers in the dean's office, while our male colleagues are never treated as administrative personnel. A university career depends not only on our talents and intellectual predispositions but also on the acceptance of informal rules. The role of a research assistant, who is a woman, often comprises the duties of a secretary: making tea, answering phones, arranging appointments with students. This is how a woman's apprenticeship at university begins, and often we are brought down to that role. Moreover, all this has its source in primary school.

A HISTORY OF A PLENIPOTENTIARY OF THE WOMEN/FAMILY/EQUAL STATUS OFFICE IN POLAND
Ewa Gabryelak

In Poland **The Plenipotentiary for Women's Office** was established in September 1986, within the Ministry of Labour and Social Policy. The first Plenipotentiary was Anna Kędzierska. Her task was, among others, to present during Cabinet meetings selected issues concerning the promotion of women for the purpose of their inclusion into governmental policy projects in a given year. In this form, the office existed until 1989. Two years later, an **Office of the Plenipotentiary for Women and Family** was created, and Anna Popowicz became the plenipotentiary. Her promotion of women and strong opposition to legislation restricting access to abortion led to her dismissal. Hanna Suchocka, the first woman to become Prime Minister of Poland, did not assign a plenipotentiary, contrary to the expectations of women's organisations. However, in anticipation of the upcoming UN Conference in Beijing in December 1994, the position of Plenipotentiary for Women and Family was given to Barbara Blida, Minister of Housing in the coalition government, formed by the Democratic Left Alliance and the Polish People's Party. Women's organisations viewed this nomination as disregardful of gender equality issues. As Urszula Nowakowska writes:

> *The new government's Plenipotentiary did not hide her lack of interest in women's issues, and that she had agreed to perform that function only because of the Prime Minister's request. As she admitted, during a meeting with women's circles and the Women's Parliamentary Group, she would willingly have given up this 'burden' to someone else.*[1]

The year 1995 brought about another change in terminology. The **Office of the Plenipotentiary for Family and Women** was established, yet the priorities of the plenipotentiary still remained focused to a large extent on the promotion of women and women's issues. Jolanta Banach of the Democratic Left Alliance assumed the position. She began to prepare a report on the situation of women in Poland, inviting women's non-governmental organisations to cooperate. The initiative was criticised by Catholic groups, which publicly left the Preparation Committee, claiming that the study omitted their point of view. A permanent Cooperation Forum of Non-Governmental Organisations and the Government's Plenipotentiary for Women and Family, established in May 1996, started working on a national activity programme for women for the year 2000. It concerned actions to be taken by ministries, local councils and non-governmental organisations within the following areas: women's and human rights, women in the decision-making process, education, economy and health of women, as well as women and the natural environment, violence towards women, women and the media, government cooperation with NGOs, and finally, research strategies and data collecting systems including that of gender.

A change in the governing coalition in 1997 frustrated plans already undertaken, while the office of the Plenipotentiary for Family and Women was eliminated. In its place, a **Plenipotentiary for the Family** was designated. The function was performed by Kazimierz Kapera, a member of the Christian National Union known for his extremely conservative views. After 20 months in office, he resigned and was replaced by Maria Smereczyńska, who was an MP representing Solidarity Election Action[2].

In 2001, the plenipotentiary position once again changed its name. The new **Plenipotentiary for Equal Status of Women and Men** became Izabela Jaruga-Nowacka, a Labour Party MP. In June 2002, the Cabinet extended the purview of the plenipotentiary:

> *The office has been established for wider policy implementation within the area of equal status of women and men, as well as counteracting discrimination due to race, ethnicity, religion, conviction, age and sexual orientation, drawing up a working schedule and preparing legislative projects*[3].

Analysis of current legislation was among the tasks of the Plenipotentiary's reformed office. In addition, it monitored the social situation regarding equal treatment and opportunities of women and men with respect to national and international mandates. Opinions issued by the plenipotentiary and her recommendations concerning, *inter alia,* proposals for legislation, informational and educational initiatives and the raising of social awareness, were to result in the implementation of **gender mainstreaming** in Poland.

GENDER MAINSTREAMING

The systematic implementation of respective situations, priorities, and needs of women and men in all policies and with a view to promoting equality between women and men and mobilising all general policies and measures specifically for the purpose of achieving equality by actively and openly taking into account, at the planning stage, their effects on the respective situations of women and men in implementation, monitoring and evaluation (Commission Communication, COM(96) 67 final, 21.2.1996).

Source: One Hundred Words for Equality; A Glossary of Terms on Equality between Women and Men, European Communities, Luxembourg 1998

An unquestionable success of Jaruga-Nowacka was a change in the Labour Code, forbidding both direct and indirect discrimination in employment, including that based on gender. The code now defines discriminatory behaviour and equalises the rights of child-raising women and men, as well as gives men the right to parental leave[4].

In 2004, the term of Plenipotentiary Jaruga-Nowacka ended. As her successor, Prime Minister Marek Belka nominated Katarzyna Kądziela, a women's activist. The candidacy, however, met with great opposition by right-wing circles as being too radical. Ultimately, Belka appointed Magdalena Środa. As new plenipotentiary, she mainly focused on the issues of violence towards women and women in the media. The reports prepared by the office of the Plenipotentiary indicated the stereotypical images of Polish women in the media, especially in advertisements, and that women were presented as sexual objects. Legislation proposed by Środa to counter violence against women was passed by the Parliament, but without a proposed clause prohibiting corporal punishment of children. She also organised training sessions and workshops to support the position of women politicians standing for local council elections. Jaruga-Nowacka commented on her successor's activity: 'As Plenipotentiary, she was less effective in the legislation area, but she greatly influenced Poles' awareness. Maybe this is the right way – for what use is a law, which we would neither want nor obey? Equality of women and men as to salary is included in the Constitution, but we know the reality is different.[5]'

Środa submitted her resignation together with the outgoing government of Belka. After 14 months in office, the new coalition government decided to do away with the position of plenipotentiary, claiming equality issues did not require a separate office. Its tasks were taken over by the Department of Women, Family and Counteracting Discrimination within the Ministry of Labour and Social Policy. The newly established Department, in the opinion of representatives of the majority of women's organisations, has one priority: to increase population growth by improving the conditions of women. However, Joanna Kluzik-Rostkowska, appointed Vice-Secretary of State in the Ministry of Labour and Social Policy in November 2005, claimed that the change in the nomenclature and, more importantly, also in the structure, is an extension and, in a sense, a continuation of the former office. According to the Minister, equal status is tantamount to 'discrimination prevention' while 'woman' and 'family' in its name widen the potential range of activity[6].

Endnotes

1 *Women in Poland 2003*, *Women's Rights Centre Report*, U. Nowakowska et al., Warsaw 2003, p. 12

2 Ibid, p. 10-15.

3 M. Denisiuk, *Prawne gwarancje równouprawnienia kobiet i mężczyzn*, [in:] *Prawne gwarancje równości kobiet*
i mężczyzn (Legal Guarantees of Equality of Rights for Men and Women [in:] *Legal Guarantees of Men and Women Equality*, ed. Z. Dąbrowska), Plenipotentiary Brochure no 7, Warsaw 2004, p. 70–80.

4 However, a man is entitled to parental leave only within certain limitations, and only if the mother refuses it for the sake of the father. The law also protects against the termination of an employment contract if it takes effect while the father is on parental leave (Denisiuk, p. 76).

5 M. Kula, *Środa on Wednesday*, *Gazeta Wyborcza* 2006 (January 2), available at http://serwisy.gazeta.pl/df/1,34471,3082604.html.

6 M. Kula, see above, M. Chińcz, Interview with Joanna Kluzik-Rostkowska, Vice-Minister for Women and Family, Lorga Foundation, available at www.oska.org.pl/index.php?option=com_content&task=view&id=111&Itemid=119-61k-19 04. 2007.

ACTIVITY OF NON-GOVERNMENTAL ORGANISATIONS FOR WOMEN IN POLAND

Zdzisława Janowska

Non-governmental organisations, concentrated around the Women's Parliamentary Group, undertook actions for the improvement of women's situation in Poland in the years 1989-2005. They represented women from all over Poland: urban areas (e.g. Warsaw, Cracow, Lodz, Wroclaw, Gdansk, Szczecin) as well as rural ones (e.g. women representatives of the Farmers' Wives Association and Agricultural Circles).

The Women's Parliamentary Group (formerly Women's Circle) began its activity as early as 1989. Its aim was to promote the idea of equal rights of women and men in every sphere of life, through:

- Creating legislation favourable to gender equality,
- Taking a stand before legislative and executive authorities with regard to instances of women's discrimination,
- Carrying out a wide range of educational activities (seminars, conferences) focused on breaking stereotypes concerning the social roles of women and men,
- Running a permanent discussion platform with women's organisations in the country (mutual exchange of information, registering postulates) in order to foster democratic state-building,
- Presenting their standpoint regarding respect for women's rights in Poland in international fora (e.g., European Parliament, UN, World Conference on Women – Beijing 1995 etc.).

The Women's Parliamentary Group is a politically independent body – from the very beginning of its existence, it has brought together women from different political parties, for whom promoting women's achievements and improving their situation in Poland is the highest priority. Between 1989 and 2005, the leaders of the organisation were: Zofia Kuratowska, Barbara Labuda, Dorota Kempka and Zdzisława Janowska. The Group has members and supporters among women researchers and experts in women's studies.

The organisation's activity in the years 1989–2001 was successful regarding the following issues:

- Implementation of Article 33, of the 1997 Constitution of the Republic of Poland, on equal rights of women and men in their family, political, social and economic life, i.e. equal rights for education, employment, career advancement, salary and social security;
- Implementation of parental leave for fathers (Labour Code 1996);
- Liberalisation of the anti-abortion law, allowing the procedure for social reasons (1997). In 1998, however, the Constitutional Tribunal rejected this change;
- Active participation in the government's activities (of the Ministry of Labour and Social Policy), aiming at introducing changes to the Labour Code (proving the necessity to implement European anti-discrimination regulations to Polish legislation). The changes applied to equality in employment in terms of accessibility to work as well as conditions of promotion, training and compensation (Labour Code, art. IIa 2001);
- Running permanent socio-political debates diagnosing the situation of Polish women in every sphere of life. Conclusions grounded in research, which proclaimed social, occupational and political discrimination against women, have been passed to the legislative and governmental institutions;
- Public disapproval of, *inter alia*, further anti-abortion restrictions, failure to carry out sexual education programmes at schools, withdrawal of refunds for contraceptives;
- Work on the Act of Equal Status of Women and Men.

ACTIVITIES IN THE YEARS 2002–2005

The coming to power of left-wing parties (2001) was favourable for carrying out legislative work to prevent any form of discrimination. Preparation for Poland's accession to the EU created opportunities for, among others:

- Establishing the position of the Plenipotentiary for the Equal Status of Women and Men; very intense endeavours within this area were undertaken by the Non-Governmental Organisation Forum, supported by the Women's Parliamentary Group;
- Legislative work (for the second time) on the Act of Equal Status of Women and Men. The initiative, fulfilling European standards and having been approved by the Equality Committee of the European Parliament, prohibited women's discrimination in any aspect of life, and was passed by the Polish Senate in 2002. Nevertheless, it was not possible to submit it for approval by the Parliamentary Committees and ultimately it failed to be enacted. Members of the right wing parties, such as the Polish Peasant's Party and the Civic Platform, played a role in its demise;
- Legislative work on the act of conscious parenthood. This project met European standards (freedom of choice in family planning, full protection during pregnancy, sexual education, prenatal examinations etc.) but, similarly to the Act of Equal Status of Women and Men, it was also rejected;
- Legislative work on a bill concerning homosexual relationships. The initiative was presented in the Senate but did not receive the approval of the Parliament;
- Enacting parental leave for fathers (2004);

- Enacting the act of domestic and family violence protection (2005). Discussion about and formulation of the act were carried out for many years by women's organisations. The project provides for creating a municipal and provincial system of domestic violence prevention and ensuring care for victims, mainly women and children.

The activity of women's organisations in Poland was not always crowned with legislative success. Polish democracy is still weak, but thanks to accession to the European Union and the necessity to adhere to its regulations, the social awareness of decision-makers has begun to change. The activity of Polish women's non-governmental organisations and constant 'nagging' for women's rights have also altered the country's consciousness in general, especially regarding employers and politicians. Non-governmental organisations have enhanced women's knowledge of the rights they can demand and provide them with the tools to do so. At the same time, they have prepared women to make justifiable decisions about their participation in the political and social life of the country.

Bibliography

Abram Monika, *Problemy wykształcenia kobiet w publicystyce poznańskiej XIX wieku. Studium porównawcze*, [in:] *Humanistyka i płeć. I: Studia kobiece z psychologii, filozofii i historii*, J. Miluska, E. Pakszys et al, Poznan University Publishing House, Poznan 1995

Abram Monika, *Aktywizacja polityczna kobiet polskich na przełomie XIX i XX wieku*, [in:] *Humanistyka i płeć. III: Publiczna przestrzeń kobiet. Obrazy dawne i nowe*, E. Pakszys, W. Heller et al., Poznan University Publishing House, Poznan 1999

Blagojević Marina, Bundule Maija, Burkhardt Anke, Calloni Marina, Ergma Ene, Glover Judith, Groó Dora, Havelková Hana, Mladenič Dunja, Oleksy Elżbieta H., Sretenova Nikolina, Tripsa Mioara Florica, Velichová Daniela, Zvinkliene Alina, *Waste of Talents: Turning Private Struggles into a Public Issue: Women and Science in the Enwise Countries,* European Communities 2004

Bober-Pełzowska Maria, Puchała Barbara, *Zmiany w poziomie wykształcenia kobiet*, [in:] *Kobieta w Polsce. Referaty na światową konferencję Dekady Kobiet ONZ*, Labour and Social Affairs Institute, Warsaw 1986

Budrowska Bogusława, Duch Danuta, Titkow Anna, *Szklany sufit: bariery i ograniczenia karier polskich kobiet. Raport z badań jakościowych*, Public Affairs Institute, Warsaw 2003

Chińcz Marzena, Wywiad z Joanna Kluzik-Rostkowską, Wiceminister ds. Kobiet i Rodziny, Lorga Foundation, available at www.oska.org.pl/index.php?option=com_content&task=view&id=111&Itemid=119-61k-19 (19.04.2007)

Denisiuk Mariusz, *Prawne gwarancje równouprawnienia kobiet i mężczyzn*, [in:] *Prawne gwarancje równości kobiet i mężczyzn,*. Z. Dąbrowska et al., Zeszyt Pełnomocnika no 7, Warsaw 2004

Domański Henryk, *Zadowolony niewolnik. Studium o nierównościach między mężczyznami i kobietami w Polsce*, Philosophy and Sociology Institute, Polish Academy of Sciences, Warsaw 1992

Dominiczak Andrzej, Wójcicka Jadwiga, *Edukacja kobiet* [in:] *Kobiety w Polsce w latach 90*, Women's Rights Centre, U. Nowakowska et al., Warsaw 2001

Dominiczak Andrzej, Wójcicka Jadwiga, *Edukacja Kobiet* [in:] *Kobiety w Polsce 2003*, Women's Rights Centre, U. Nowakowska et al., Warsaw 2003

Dzięcielska-Machnikowska Stefania, Kułpińska Jolanta, *Awans kobiety*, Wydawnictwo Łódzkie, Lodz 1966

Education [in:] *Europe in Figures — Eurostat Yearbook 2006–07*, EUROSTAT, Brussels 2006

Encyklopedia Popularna, PWN, Warsaw 1982

Felix Bernard, *Employment and Earnings in High-tech Sectors,* [in:] *Statistics in Focus: Science and Technology*, EUROSTAT, Brussels 2007, epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-032/EN/KS-SF-07-032-EN.PDF (21.03.2007)

Florczak-Bywalec Jadwiga, *Sytuacja kobiet na rynku pracy*, [in:] *Kobieta w rozwijającym się społeczeństwie socjalistycznym*, S. Dzięcielska-Machnikowska, Wydawnictwo Łódzkie, Lodz 1975

Frank Simona, *R&D Personnel*, [in:] *Statistics in Focus: Science and Technology*, EUROSTAT, Bruksela 2006, http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-NS-06-007/EN/KS-NS-06-007-EN.PDF (21.03.2007)

Frank Simona, *R&D Personnel in the EU,* [in:] *Statistics in Focus: Science and Technology*, EUROSTAT, Brussels 2005, http://epp.eurostat.cec.eu.int/cache/ITY_PUBLIC/KS-NS-05-003/EN/KS-NS-05-003-EN.PDF (21.03.2007)

Fuszara Małgorzata, *Kobiety w polityce*, Trio, Warsaw 2006

Götzfried August, *Women, Science and Technology: Measuring Recent Progress towards Gender Equality,* [in:] *Statistics in Focus: Science and Technology*, EUROSTAT, Brussels 2004, http://ec.europa.eu/research/science-society/women/wssi/pdf/stat-focus_en.pdf (21.03.2007)

Górnicka-Boratyńska Aneta, *Stańmy się sobą. Cztery projekty emancypacji (1863–1939)*, Świat Literacki, Izabelin 2001

Halbersztadt Jerzy, *Kobiety w murach Uniwersytetu Warszawskiego 1915–1939*, [in:] *Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim*, A. Żarnowska, A. Szwarc et al., Wydawnictwo DiG, Warsaw 1996

Historia polskiej nauki, http://www.nauka.gov.pl/mein/index.jsp?place=Lead08&news_cat_id=506&layout=2&page=psci&news_id=1244, (14.03.2007)

Historia kobiet, http://historia_kobiet.w.interia.pl/teksty/sklodowska.html, (29.05.2007)

Investing in Research: An Action Plan for Europe, European Commission, Luxembourg 2003

Key Figures 2003-2004, European Commission, Luxembourg 2003

Kobieta w Polsce, Main Statistical Office, Warsaw 1975

Kondracka Mariola, *Kobiety na uniwersytetach*, [in:] *Równe prawa i nierówne szanse. Kobiety w Polsce międzywojennej. Zbiór studiów*, A. Żarnowska, A. Szwarc et al., Warsaw University History Instutute, Warsaw 2000

Krzywicka Irena, *Wyznania gorszycielki*, Czytelnik, Warsaw 1995

Kula Magdalena, *Środa w środę*, *Gazeta Wyborcza* (02.01.2006), available at http://serwisy.gazeta.pl/df/1,34471,3082604.html

Kusiak Alicja, *Łucja Charewiczowa — inicjatorka badań nad przeszłością kobiet polskich*, [in:] *Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim*, A. Żarnowska, A. Szwarc et al., Wydawnictwo DiG, Warsaw 1996

Literatura polska. Przewodnik encyklopedyczny, vol. 1, PWN, Warsaw 1984

Lohmann Kinga and Seibert Anita, *Gender Equality and EU Accession: The Situation in Poland*, [in:] *WIDE Information Sheet. Globalising Gender Equality and Social Justice*, WIDE, Brussels 2003, available at http://www.eurosur.org/wide

Mazurczak Dorota, *Dążenia kobiet polskich do wyższego wykształcenia na przełomie XIX i XX wieku*, [in:] *Humanistyka i płeć, I: Studia kobiece z psychologii, filozofii i historii*, J. Mińska, E. Pakszys et al., Poznan University Publishing House, Poznan 1995

Mazurczak Dorota, *Kariery akademickie kobiet w Polsce międzywojennej — Uniwersytet Poznański*, [in:] *Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim*, A. Żarnowska, A. Szwarc et al., Wydawnictwo DiG, Warsaw 1996

Molik Witold, *Drogi edukacji córek ziemiańskich w Wielkopolsce w XIX i na początku XX wieku*, [in:] *Humanistyka i płeć I. Studia kobiece z psychologii, filozofii i historii*, J. Miluska, E. Pakszys et al., Poznan University Publishing House, Poznan 1995

National Policies on Women and Science in Europe, European Commission, Luxembourg 2002

Nauka i technika w 2003 r, Main Statistical Office, Warsaw 2005

Nauka i technika w 2004 r., Main Statistical Office Warsaw 2005

Nauka i technika w 2005 r., Main Statistical Office, Warsaw 2006

Nowakowska Urszula, *Instrumenty państwa na rzecz awansu kobiet*, [in:] *Kobiety w Polsce 2003*, *Women's Rights Centre*. U. Nowakowska et al., Warsaw 2003

Nowakowska Urszula, *Instrumenty państwa na rzecz awansu kobiet*, [in:] *Kobiety w Polsce w latach 90.*, *Women's Rights Centre,* U. Nowakowska et al., Warsaw 2001

Pakszys Elżbieta, *Kobiety w polskiej filozofii analitycznej. W stulecie Szkoły Lwowsko-Warszawskiej (1895–1995)*, [in:] *Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim*. A. Żarnowska, A. Szwarc et al., Wydawnictwo DiG, Warsaw 1996

Perkowska Urszula, *Kariery naukowe kobiet na Uniwersytecie Jagiellońskim w latach 1904–1939*, [in:] *Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim*, ed. A. Żarnowska, A. Szwarc, Wydawnictwo DiG, Warszawa 1996

Pietrzak Michał, *Sytuacja prawna kobiet w Drugiej Rzeczpospolitej*, [in:] *Równe prawa i nierówne szanse. Kobiety w Polsce międzywojennej. Zbiór studiów*, ed. A. Żarnowska, A. Szwarc, University of Warsaw History Institute, Warsaw 2000

Pinińska Joanna, *Women and Science: a Review of the Situation in Poland*, [in:] European Commission *National Policies on Women and Science in Europe*, European Commission, Luxembourg 2002

Polityka Równości Płci w Praktyce. Podręcznik, UNDP, Warsaw 2006

Program Operacyjny Kapitał Ludzki. Narodowe Strategiczne Ramy Odniesienia 2007–2013, Ministry of Regional Development, Warsaw 2006

Regular reports on progress towards accession and strategy papers for Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia, European Commission 1998–2003, http://europa.eu.int/comm/enlargement/report_2003/index.htm (5.01.2006)

Rocznik statystyczny 1998, Main Statistical Office, Warsaw 1998

Science and Society Action Plan (COM (2001) 714), European Commission, Luxembourg 2001

Science and Technology, [in:] *Europe in Figures — Eurostat Yearbook 2006-07*, EUROSTAT, Brussels 2006

Siemaszko Andrzej, Supel Jerzy, Ocena udziału Polski w Programach ramowych UE, Krajowy Punkt Kontaktowy programów Badawczych UE, http://www.6pr.pl/statystyki/udział_pl.html, (21.03.2007)

She Figures 2003, European Commission, Luxembourg 2003

She Figures 2006, European Commission, Luxembourg 2006

Siemieńska Renata, *Polacy i Polki w życiu publicznym — podobni czy różni od mieszkańców Unii Europejskiej*, [in:] *Aktorzy życia publicznego. Płeć jako czynnik różnicujący*, ed. R. Siemieńska, Wydawnictwo Naukowe Scholar, Warsaw 2003

Sierakowska Katarzyna, *Przegląd piśmiennictwa poświęconego dziejom kobiet w Polsce międzywojennej*, [in:] *Równe prawa i nierówne szanse. Kobiety w Polsce międzywojennej. Zbiór studiów*, A. Żarnowska, A. Szwarc et al., University of Warsaw History Institute, Warsaw 2000

Sokół Zofia, *Walka kobiet o wstęp na uniwersytety w Polsce*, http://www.efka.org.pl/index.php?action=p_art&ID=6, (19.10.2004)

Sprawozdanie w sprawie wniosku dot. decyzji Parlamentu Europejskiego i Rady dotyczącej siódmego programu ramowego Wspólnoty Europejskiej badań, rozwoju technologicznego i demonstracji (2007–2013), http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A6-2006-0202+0+DOC+WORD+V0//PL, (30.03.2007)

One Hundred Words for Equality: A Glossary of Terms on Equality between Women and Men, European Commission, Luxembourg 1998

Szkoły wyższe w latach 1994–1995, Main Statistical Office, Warsaw 1995

Third European Report on Science & Technology Indicators: Towards a Knowledge-based Economy, European Commission, Luxembourg 2003

Wapiński Roman, *Kobiety i życie publiczne — przemiany pokoleniowe*, [in:] *Równe prawa i nierówne szanse. Kobiety w Polsce międzywojennej. Zbiór studiów*, A. Żarnowska, A. Szwarc et al., Warsaw University History Institute, Warsaw 2000

Wieruszewski Roman, *Równość kobiet i mężczyzn w Polsce Ludowej*, Wydawnictwo Poznańskie, Poznan 1975

Wierzbicka Maria, Jakubowska Barbara, *Autorki i dzieła — kobiety w polskiej nauce historycznej w dwudziestoleciu międzywojennym*, [in:] *Kobieta i kultura. Kobiety wśród twórców kultury intelektualnej i artystycznej w dobie rozbiorów i w niepodległym państwie polskim*, A. Żarnowska, A. Szwarc et al., Wydawnictwo DiG, Warsaw 1996

Wilén Håkan, *R&D in High Education and Government*, [in:] *Statistics in Focus: Science and Technology*, EUROSTAT, Brussels 2007, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-035/EN/KS-SF-07-035-EN.PDF, (21.03.2007)

Wilén Håkan, *Science Graduates Are Younger and Better Employed,* [in:] *Statistics in Focus: Science and Technology*, EUROSTAT, Brussels 2006, http://epp.eurostat.ec.europa.eu/cache/ ITY_OFFPUB/KS-NS-06-018/EN/KS-NS-06-018-EN.PDF, (21.03.2007)

Woolf Virginia, *Three Guineas*, Sic!, Oxford University Press, Oxford 1999

Women and Science — Mobilising Women to Enrich European Research, European Commission 1999, http://europa.eu.int/comm/research/sciencesociety/documents_en.html, (05.01.2007)

Women and Science. Excellence and Innovation — Gender Equality in Science, European Commission, Luxembourg 2005

Women in Science and Technology: The Business Perspective, Science, European Commission, Luxembourg 2006

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WOMEN IN SCIENCE IN SLOVAK REPUBLIC

Magdaléna Piscová and Daniela Velichová

Waste of Talents or on the Way from Private Struggles to Public Issue

Daniela Velichová

The European Commission and its Directorate General for Research and Development have been conveying systematic research focused on women in science for several years. To foster the presence of women in science, and not only in a quantitative but namely in a qualitative way, is the main reason for the European Commission's initiatives in accordance with the EU's gender sensitive policy known as gender mainstreaming. One of the activities towards the better utilisation of the knowledge potential of women was the establishment of the women expert group – active women scientists from different branches of science and research from twelve countries of Central and Eastern Europe and the Baltic States. This group consisted of representatives from the countries of the former socialist block (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Slovenia, Serbia and the former German Democratic Republic) and also the Baltic States (Latvia, Lithuania and Estonia) and started its work in January 2003. The task of the expert group was to prepare a wide-ranging report on the position and situation of women in science in the cited countries. The group's work was organised and coordinated by DG Research RTD C5 Women & Science at the European Commission. I was to be the representative of the Slovak Republic in the above mentioned expert group, known as ENWISE (**En**large **W**omen **I**n **S**cience to **E**ast). The activity of this group was a natural continuation of the successful work of several expert groups with a similar orientation, such as ETAN (**E**uropean **T**echnology **A**ssessment **N**etwork), whose report *Promoting excellence through mainstreaming gender equality* informed about the situation of women in science in the former EU countries, or the Helsinki Group (associating representatives of all the EU member states and countries associated to the Framework Programmes), which originated in order to support gender equality in science throughout Europe and whose results were published in the report *National Policies on Women and Science in Europe*.

The report of the Enwise group was accepted by the former Commissioner for Research and Development Philippe Busquin during a press conference held on January 30, 2004 in Brussels with the press and other media from all over the world present. The title of the report - ***Waste of talents: turning private struggles into a public issue, Women and Science in the ENWISE countries***, speaks for itself about the report's message, bringing deep insight into the everyday struggles of women scientists in the hard reality of inadequately developing and weakly saturated sectors of science and research in difficult economic conditions of countries reforming all spheres of their social and private life (including the private lives of families and their members), and transforming national economies during the accession process leading to full membership of the European Community.

Optimistic statistics proving the high professional qualities and high percentage of participation of women in science and research in the Enwise countries, where in 2001 women represented up to 38% of all scientific work force (while in old EU countries it was 27%), however, do not blank out the unpleasant fact that the majority of women scientists work in scientific fields with minimal expenditure on science and development. Women are still not adequately represented at the leading posts, nor in decision-making bodies and commissions or the top positions at academies of sciences and universities, although they represent up to 54% of academic staff. The probability of reaching higher academic posts, strategic positions and acknowledgement by the scientific community was tree times lower for women than for their male colleagues.

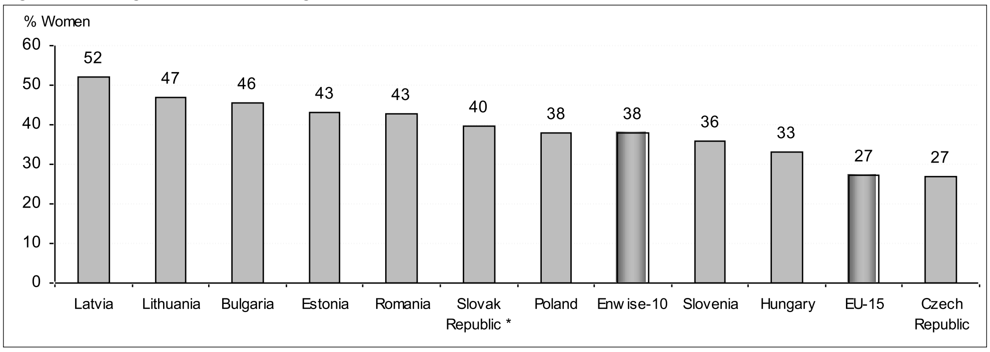
In spite of these limitations, women scientists from the Enwise countries entered the European Research Area very actively and cooperated considerably in scientific and research activities within the 5th and mainly the 6th Framework Programmes of the European Community, which formed the strategic driving force to foster research itself, as well as to frame and considerably support the role and position of women in science, not only in the new member states, but in the overall European context. During the 5th Framework Programme, women formed 34% of all evaluators from the Enwise countries, while the relevant data for the 15 EU member states was only 22%. We can expect even higher participation of successful women researchers and evaluators in the current 6th and the prepared FP7th.

In his own words, Commissioner Philippe Busquin said: '*The human resource potential consisting of women scientists from the post-communist candidate countries is of utmost importance for the European Research Area. The Enwise expert group report points to the fact that the abilities of women scientific and research workers can be utilised much more intensively and thoroughly than they have been till today. It will be necessary to initiate further activities to foster issues on women in science in the enlarged Europe. Women scientists from the Enwise countries must have the chance to be valuable adequately to their abilities in the European Research Area and to play a crucial role in it.*'

The Enwise report not only presents a full-scale view of the situation by means of variable factors and by presenting many statistical indicators, which were collected and interpreted gender sensitively by expert group members, but it also explains the reasons influencing and forming the current situation of women scientists. While before Communist times women in the Enwise countries had access to education and political rights, at a much earlier stage than women in Western European countries, under the Communist regime equality had been considered as the side effect of the overall equalisation, and issues of gender equality were of no special interest. An easy proof of this attitude is the fact that from this period practically no relevant reliable gender selected and segregated statistics exist, as well as the total absence of statistical follow-up of gender representation in the key statistical indicators in all sectors of social life, not excluding science and research.

Transformation to the market economy caused dramatic changes in the whole society and the economy, which were reflected negatively also in science and research. This sector lost its former, though formally fostered and merely nominal, privileged position resulting from its representation as the driving force of the development and progress of advanced socialist society, and its strategic orientation to ensure the protection and defence of the 'achievements of socialism'. Until now it has not found its new 'sense of existence', mission and role in the newly born market oriented consumer society, not to mention the loss of prestige of science and scientists and the under-evaluation of their importance for society in general. In this atmosphere of uncertainty and searching, the position of women in science, which is rather strong in terms of quantitative indicators but weak in terms of qualitative factors, looks very different. In the periodical of the European Commission CORDIS focus, Community Research and Development Information Service No. 238 from February 9, 2004 the report summarising the findings of the Enwise report appeared symptomatically under the title *Report on Women scientists in central and Eastern Europe shows women still 'misused by society.'*

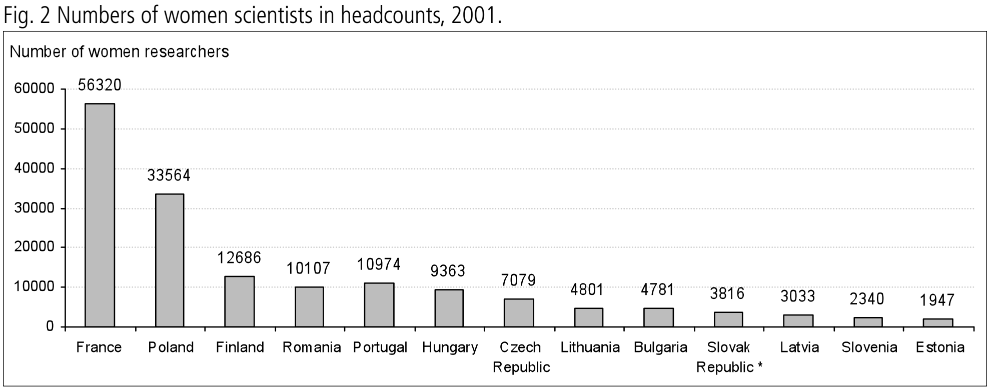
Fig. 1 Percentage of women among scientific workers in Enwise countries, 2001.



Source: European Commission, She figures, 2003

In spite of the higher percentage of participation of women researchers in the overall scientific potential of the Enwise countries (of the total number of 214 000 persons, 81 000 are women, which represents 38%) compared to the 15 old EU member states, the considerable differences between absolute numbers of women researchers in the different Enwise countries must be taken into consideration, which also indicate some adverse facts. Comparing graphs in Fig. 1 and Fig. 2, it is clear that with respect to the 'size' of scientific communities in some Enwise countries, the optimistic percentage of women's participation in science is quite a vague indicator of equal chances. This indicator can induce a false impression that the position of women in science in the Enwise countries is generally more satisfactory than in the old member countries of the European Community, and women scientific and research workers do not need any special help and support, or the introduction of some extra regulations, as they are rather successfully represented in the research areas of their countries, and also within the European Research Area. To make sense of the whole situation it is necessary to quote the percentage of participation of women researchers in some EU countries presented on the graph in Fig. 2, where in France women form 27% of the total number of scientific and research workers, in Finland 28% and in Portugal 44%. *Statistical data concerning the Slovak Republic show the Full time equivalent – FTE, as an exception to the Head counts - HC presented as data for all other countries.

Fig. 2 Numbers of women scientists in headcounts, 2001.



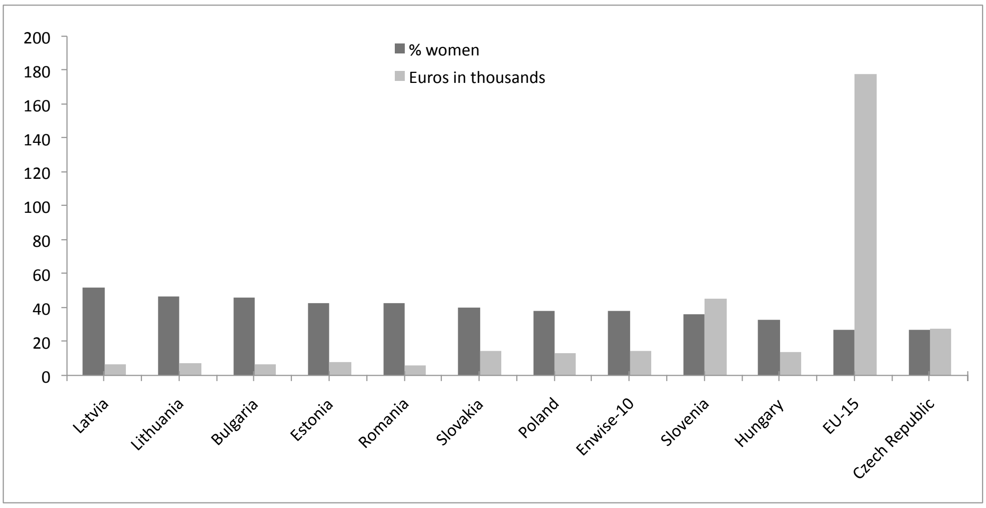
Source: European Commission, She figures, 2003

The overall growth in the numbers of research workers, both men and women, after the enlargement of the European Community in May 2004, which was achieved by the scientific communities of the eight new member states, represents a total of 180,000 persons, which constitutes about 16%; growth in the numbers of women in science and research by about 66,000 women researchers even represents an increase of up to 22%. Despite this, the total growth only slightly influenced the overall increase in the percentage of women's participation in science and research within the enlarged Europe, consisting of 23 states. In the state (government) sector of science and research, the percentage of women has increased from 31% to 33%, in the higher education sector from 33% to 34%, and in the business enterprise sector the percentage of women is a bit less than 16%, compared to the former 15%. In this context we must clearly realise that our republic with a rather high percentage of women working in science and research (40%) contributed to the European research potential only by a negligible number of women scientists and researchers (about 5.8% of the total of 66,000), whose position and situation are determined by the economic conditions and social situation in the country. The structure of the scientific community in Slovakia is also worth mentioning, since according to available statistical data, the horizontal distribution of women in the hierarchy of scientific disciplines and their vertical distribution are reaching dangerously critical values. Women scientists with the highest academic degrees of professor and doctor of sciences form only 2.3% of the total number of women scientists in the SR, while for men the proportion of scientists with the highest academic titles is 15.4% of the total number of men in science. To meet a woman professor or doctor of sciences in the Slovak scientific community is 7-times less probable than to meet her male colleague, which is undoubtedly a statistical indicator interpretable also in a much less diplomatic way.

One of the extremely strong arguments documenting the unfavourable conditions in science, research and development in the Enwise countries and the concentration of women scientists in the fields with the lowest expenditures and investment in development is the comparison of the percentage of women's participation among scientific workers and expenditure invested in science and research per scientist in the different Enwise countries, in the Enwise countries together, and in the former 15 EU member countries. From a geographic point of view, the participation of women in science and research is higher in countries with the lowest number of researchers active in this sector, where there is simultaneously the lowest expenditure invested into science and research per inhabitant. The correlation between the percentage of women's participation among researchers and expenditure on science and research is clearly illustrated in the graph in Fig. 3. The higher percentage of women's participation in science in the different countries is in direct correlation to the lower expenditures on research and development. The difference in these two quantitative indicators in the Enwise countries and in the EU 15 shows that the equality of chances, gender balance and invigoration of research capacities must go hand in hand with the strengthening of the position of science and research in the new EU member countries, if they want to take an active and equal part in activities within the enlarged European Research Area.

The Enwise report also shows many relevant facts related to problems with a dilemma concerning the younger generation of scientific and research workers. Socially and economically unbearable limiting factors, as well as the structural conditions of the scientific systems themselves in the Enwise countries, hinder them from fully developing their intellectual potential and from growing into recognized women and men researchers and scientific individuals simultaneously with taking care of their children and family. These circumstances are frequent reasons for direct brain-drain, the ebb of young talented people abroad and very often also outside the European Research Area.

Fig. 3 Percentage of women among scientists in comparison to the expenditure on science and development per capita (women and men together) annually in Euro, 2001.



Source: European Commission, She figures, 2003

Recommendations addressed to key institutions, without whose activities no visible changes could be achieved to guarantee equality of chances for men and women directed towards improvements in the position of women in science in the Enwise countries, are also an important part of the report. The report is addressed to the Council of Ministers and the European Parliament, the European Commission, R&D national policy makers in the individual Enwise countries, universities and scientific institutions, professional organisations and societies, information media, as well as women scientists and women's associations.

Final evaluation of the results and the impact of the Enwise expert group report was performed during the conference about problems associated with the position of women in science in the enlarged Europe, held in Tallinn in September 2004 under the auspices of the speaker of the Estonian parliament, Prof. Ene Ergma, chairwoman of the Enwise expert group. On this occasion, printed copies of the report in English were officially presented. In addition to the representatives of the European commission (former Commissioner for Research and Development Philippe Busquin) and the European Parliament (Anna Karamanu), members of the Enwise expert group and women scientists from almost all European countries, representatives of the education and science sectors from all Enwise countries and respected representatives of press and other media were invited.

The importance and impact of the Enwise report should also be seen in the broader context. Its message concerns not only women in science, but it is also focused on, and endeavours to inform about, the unfavourable and adverse situation in science itself in some countries which are already members of the European Research Area.

Women in Science Debate

Magdaléna Piscová

EQUALITY AS A PRINCIPLE AND AIM

The position of women in society is a very important indicator of the level of its democracy. As in other countries, equality between men and women in Slovakia is part of the fundamental rights and attributes of democracy, as well as an expression of social justice in society. The principle of equal treatment of men and women is guaranteed by the *Constitution of the Slovak Republic*. In 1993, the Slovak Republic became a signatory of the *UN Convention on the Elimination of All Forms of Discrimination against Women*, and in 2000 it ratified the Optional Protocol to the Convention. Slovakia's current legislative and regulatory framework is more or less compatible with EU legislation, which explicitly defines equality between men and women as one of its core values. All EU gender directives were transposed into the legislation of the Slovak Republic and have considerably helped to reinforce the gender equality principle in everyday life. The adoption of the *Act No. 365/2004 Coll. on Equal Treatment* has played a significant role[1].

Currently there are two main documents related to gender equality in Slovakia. The first one is the *National Action Plan for Women* and the second is the *Strategy Document on Equal Opportunities for Men and Women*. The action plan was adopted in 1997 on the basis of the Beijing Declaration and represented the main programme document for the subsequent ten years. This document had a declaratory form and placed more emphasis on stating the priorities, rather than on actual tasks and individual responsibilities. For the first time the term 'mainstreaming' was used in this document. Although the government evaluated the National Action Plan every year, it was a very formal act and its practical efficiency was rather insufficient. In 2001 the government adopted the *Strategic Document on Equal Opportunities for Men and Women*, which connected to the preceding action plan and was built on the experiences and problems which occurred during its implementation. Its concept can be considered more complex and better developed with the main focus being on the labour market, public, political and family life, and the reconciliation of work and private life. At the beginning of the 1990s, the labour market was marked by profound modifications that fundamentally influenced the position of women in the economy and led to the increased need for enhancing gender equality and the equal opportunity principle of men and women. Although neither of the documents was drafted as a result of an internal need of society, and the concepts behind them mainly arose from the European Commission's requirements in terms of our accession process into the EU, some positive measures were successfully adopted into practice.

One such measure is the 'Family and Work' audit. Regularly every year the Ministry of Labour, Social Affairs and Family of the Slovak Republic announces a call for companies to take part in the audit with the aim of recognising and appraising family-friendly employers. Despite legislation which allows for employers to create and implement flexible working conditions, there is still little interest from both employers and employees to follow them. To strengthen gender equality in practise, the organisation of another regular audit focused on the idea of 'a family friendly village' is also under consideration.

INSTITUTIONAL GUARANTEE OF GENDER EQUALITY POLICIES

Institutional mechanisms to provide gender equality policies are not stable and are very often changed and transformed. The gender equality agenda has been an official institutional agenda in the Slovak Republic since the 1990s. The first body responsible for gender equality issues was established between 1991-1992 – it was the *Governmental Committee for Women and Family*. Between 1992–1996, gender equality and women's issues became part of the family agenda administered by the Ministry of Labour, Social Affairs and Family of the SR. The *Coordination Committee for Women* was established as a result of the Fourth World Conference on Women in Beijing, with the status of governmental committee. In 2000, the status of the committee was reduced to an advisory body at ministerial level, without any competencies. At the same time the *Department for Equal Opportunities for Men and Women* was established at the Ministry of Labour, Social Affairs and Family. The Coordination Committee was dissolved in 2002. On the parliamentary level the Committee for Equal Opportunities and the Position of Women was established as part of The National Council Board for Human Rights, Minorities and the Position of Women. The committee was an advisory body to the board. Its aim was to prepare comments on gender equality issues in legislation and to make statements on all relevant documents in the gender equality field. The activity of this committee was renewed after the elections in 2006.

The existing *Department for Equal Opportunities of Men and Women* at the Ministry of Labour, Social Affairs and Family of the SR was transformed in 2003 into the *Department for Equal Opportunities and Antidiscrimination*. In 2005, due to structural changes within the Ministry of Labour, Social Affairs and Family of the SR, this 'equal opportunity' department was again transformed into the *Department for Family and Gender Policy*. It was the first time that the term 'gender policies' became part of the political structure, which could be considered a significant step forward. On the other hand, the linking of gender policy and family policy carries the risk that the concept of gender equality will be inspired by a traditional perception of women's role. Frequent institutional changes in the gender equality agenda indicate the absence of clear gender strategy as well as the fact that gender equality has not yet become a generally accepted value.

After the formation of a new government in 2006, the Ministry of Labour, Social Affairs and Family changed its approach to the institutional provisions of the gender equality agenda. An independent department for gender equality and gender opportunities was established. The department is under direct supervision of the minister, which indicates a shift towards greater importance of the agenda.

A BRIEF EXCURSION TO RECENT HISTORY AND TO ATTITUDES TOWARDS THE POSITION OF WOMEN

During the socialist era, the position of women and their emancipation was the result of top-down political decisions. It was not the outcome of the fight for women's rights or the women's movement, as was the case in western societies. After the fall of state socialism, the position and role of women in society and the family began to be the subject of a broad public debate. Women had to face a new social pressure to return to their traditional role – caring for family and children. A number of public representatives had welcomed the democratisation process as a great opportunity for women to stop working and return to households. Fortunately, this approach did not find a significant number of women followers. An important voice in the debates came from non-governmental organisations, which established themselves after 1989 as part of a new civic society. Various entities from the third sector replaced the 'Women's Union', which was the only dominant government-supported organisation. This public discourse can be viewed very positively since it became a tool for disrupting the deep-rooted stereotypes in gender roles in the society. The public view of women's role was strongly linked with taking care of household and children. Women's income was considered as being only supportive, additional to the family's budget, even if the double-income family model was (and still is) an economic necessity for the majority of families.

Although gender stereotypes were deep-rooted in Slovak society, at the beginning of the 1990s the public began to perceive the gender division more sensitively. Results of family research carried out in 2002 (within the framework of the International Social Survey Programme – ISSP) revealed the public's expectations about men and women. The role of women should be mostly situated in the family-care sphere whereas the role of men is to provide economic support to the family[2]. In this research, almost 49.2 % of respondents were in favour of the statement that women's role is to take care of the family and men's role is to earn money and financially support the family . A different survey, realised as part of the EQUAL programme project in June 2006[3], showed a slight shift from the 'traditional' gender role division towards a partner role division. In answer to the same question as in the previous ISSP research, only 44.7 % of respondents agreed that women should take care of the family and men should take care of the finances. The same research tried to find an answer to the question whose life is easier – men's or women's? Out of a total of 2521 respondents, almost 30 % of men and 63 % of women agreed with the opinion that a man's life is easier. Those who stated that men and women have an equally good life were in a minority and only a few of them (men only) expressed the opinion that a woman's life is easier.

SOME FACTS ABOUT WOMEN ON THE LABOUR MARKET

Women in Slovakia represent almost 45 % of the economically active population. Current employment rates of men and women vary between 51-52 % and 62-64 % respectively. It is important to add that women's employment rate is far below the targets of the Lisbon Strategy. This strategy sets the desired women's employment rate at the level of 60 %. At the beginning of the 1990s the decline in women's employment decreased because of economic transformation. The decline recorded in the last few years is the result of longer occupational training and a slight increase in the number of beneficiaries of maternity and parental leave[4]. A very adverse situation in women's employment is to be found in the age group over 55 years, where the employment rate in 2005 was only 15 %, whilst the average employment rate for this age group in EU member states was 33.8 %. Based on the comparison between individual countries, we can claim that in Slovakia women over 55 years of age have the second lowest employment rate (after Malta) in the entire EU. To complete the situation of aging women it is useful to add that the average retirement age of women in Slovakia is one of the lowest within the EU.

Table 1. Employment rate in the Slovak Republic by gender in 2000 - 2005 (in %)

YEAR	2000	2001	2002	2003	2004	2005
MEN	62.2	62.0	62.4	63.3	63.2	64.6
WOMEN	51.5	51.8	51.4	52.2	50.9	50.9

Source: Indicators for monitoring of Employment guidelines 2006 Compendium, latest update 01/08/2006

As the table shows, the difference in employment between men and women oscillates steadily around the level of 12 %. The difference is influenced by age - the smallest distinctions are in the younger age groups. The most extreme differences are in the age group of 55-64 year-olds, in which the employment rate of men is almost three times higher than that of women. The situation of senior women in the labour market is in general very unfavourable.

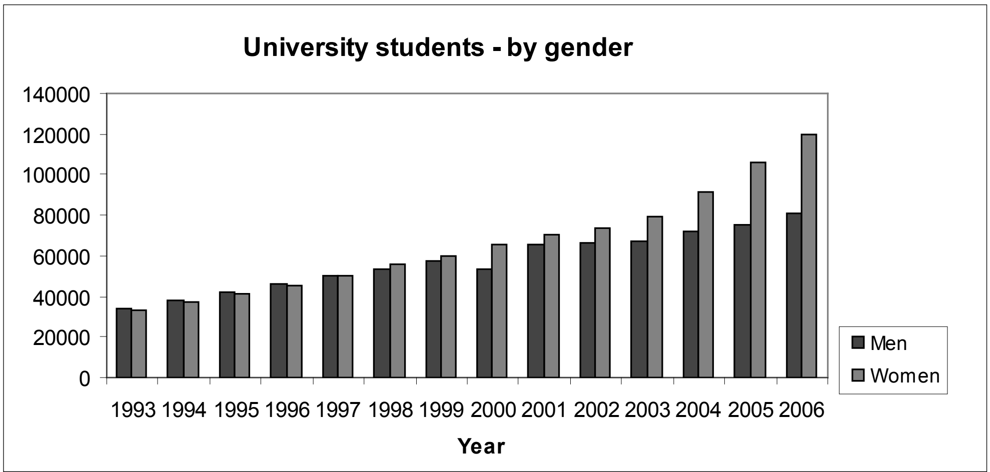
Since 2001, the unemployment rate among women exceeded the unemployment rate of men, and it is one of the highest in Europe. (Based on Eurostat statistics, the 17.3 % unemployment rate of women in 2005 was 2 percentage points higher than that of men). The fact that the continuous decline of unemployment overall is accompanied by a simultaneous relative increase in long-term and very-long-term unemployment results in a serious problem. In 2005, Slovakia had 12.3 % economically active women and 11.3 % economically active men who were unemployed for more than one year. A more unfavourable situation is in the group of very-long-term unemployed – people who are jobless for more than four years. Those people represent approximately 40 % of all the unemployed and are basically excluded from the labour market. The long-term unemployment phenomenon does not only concern older, unskilled or low-skilled population, as might be expected. It applies in particular to cases where long-term unemployment affects women with secondary education and those over 30 years old. It could be correctly supposed that this group of women has a problem competing on the labour market due to maternity or parental leave.

WOMEN AND EDUCATION

Despite the facts about the adverse situation of women on the labour market compared to men, this does not lower their contribution to various areas of human work and human knowledge. Presently the educational level of women is fully comparable to men's and it is even superior in many areas. A steady growth of university students (especially women) has been recorded since the beginning of the 1990s. In 1997 for the first time the number of women studying exceeded that of male students, which is considered to be a breakthrough in terms of student gender structure. One of the interesting phenomena is a rapidly increasing number of female students taking external forms of university studies.[5]

The number of female students was also affected by the increasing number of universities and colleges. Considering the geographical size of Slovakia, as well as the country's pedagogical potential, the number of universities and colleges, in our opinion, has reached a certain 'threshold value'. In 2006 there were 20 'high level' education bodies in Slovakia, of which 17 were universities and 10 were private colleges.

Graph 1



Source: The Institute of Information and Forecasting on Education, http://www.uips.sk/statis/index.html
Note: Data covers university students in all forms of study. Some students could be enrolled in more than one university.

The higher proportion of women among students results in a higher proportion of female graduates. The structure of graduates by field of study provides evidence of the relatively strong and deep-rooted horizontal gender segregation by fields of study. A comparison of the structure of female graduates over a period of several years does not confirm the hypothesis that the higher proportion of women among students leads towards reinforcing their interest in studying typically 'female' subjects. The comparison in the table below shows that the gender distribution of graduates is relatively stable despite the increase in the total number of male and female graduates.

According to the data in Table 2, there have been some shifts in the structure of female graduates. The most noticeable digression is from cultural sciences and humanities and there is a slight increase in technical and agricultural sciences.

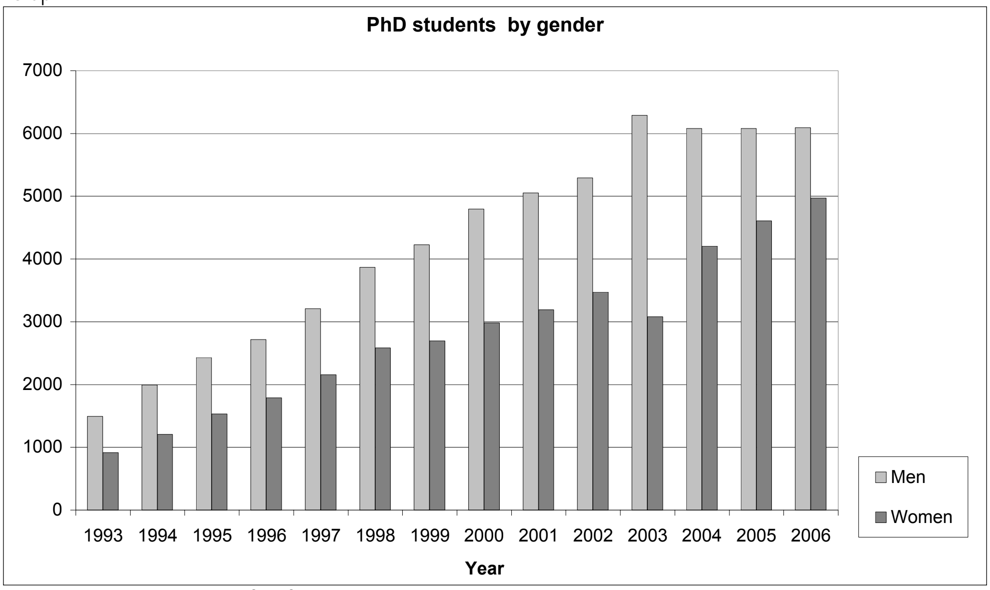
A similar increase was observed in doctoral studies. The increase in the number of doctoral students (PhD students) was not as linear as in the number of graduate students, and it was different for men and women. While the number of female students in doctoral studies remains stable, statistics recorded from 2003 onwards show a decline in male students interested in this form of study. The discontinuity in the number of female doctoral students was noticed in the same year. These trends could also have been (somehow) affected by legislative changes concerning the social and economic status of PhD students.

Table 2. University female graduates in 1999 and 2005 by branch of study

	1999		2006	
Study programme	Abs.	Rel.	Abs.	Rel.
Natural sciences	444	4.7	1,013	5.1
Technical sciences and informatics	746	7.9	2,042	10.3
Agricultural sciences	227	2.4	1,014	5.1
Medical and pharmaceutical sciences	1,063	11.3	2,239	11.2
Social sciences	6,179	65.5	12,973	65.2
Cultural and humanities sciences	772	8.2	500	2.5
Military and defence sciences	-	-	123	0.6
	9431	100.0	19,904	100.0

Source: The Institute of Information and Forecasting on Education, http://www.uips.sk/statis/index.html and National Policies on Women in Science in Europe, EC March 2002, s. 127,+ author's calculations

Graph 2

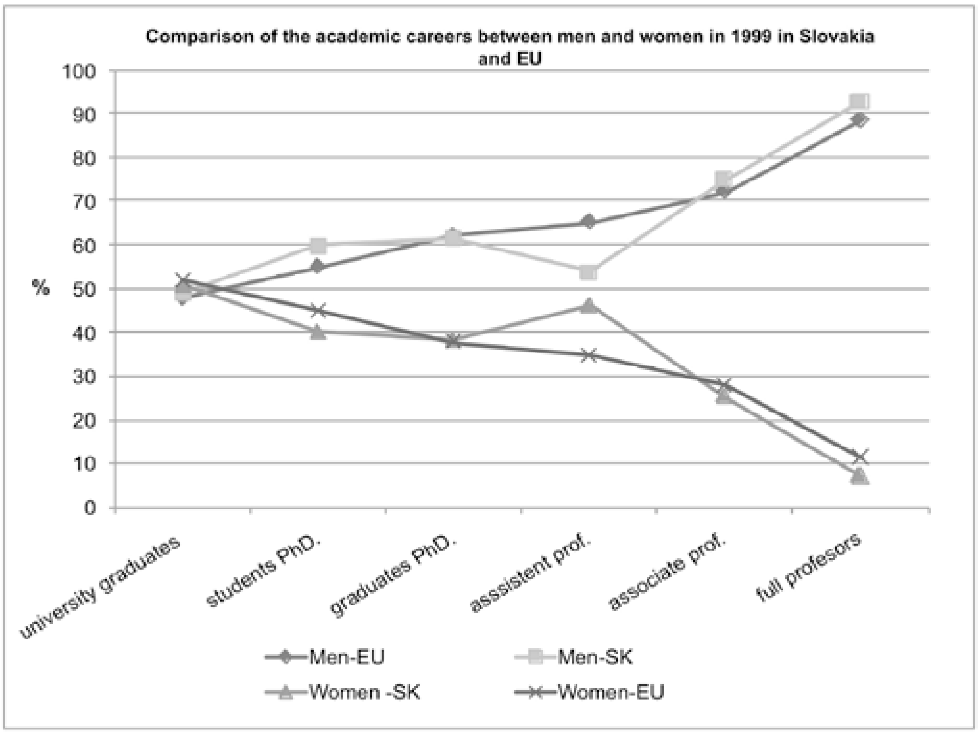


Source: The Institute of Information and Forecasting on Education, http://www.uips.sk/statis/index.html

ACADEMIC CAREERS OF MEN AND WOMEN

The difference in academic careers of men and women in the 'old' EU member countries was initially shown in the ETAN report (realised by initiative of the European Commission in 1998). The report showed the so-called 'scissor graph', which illustrates the academic career path of men and women based on their qualification degrees. While at the beginning the paths for both men and women were almost identical, at the end they went in opposite directions. Academic careers of men and women in Slovakia show a very similar behaviour. The following two graphs show the very deep-rooted nature of this path. One graph compares the situation between our country and the 'old' EU member states in 1999, while the other one maps the present situation in Slovakia. As can be seen, the situation has not changed in any significant or important way through time. The shifts in the development of men's and women's careers are very small.

Graph 3

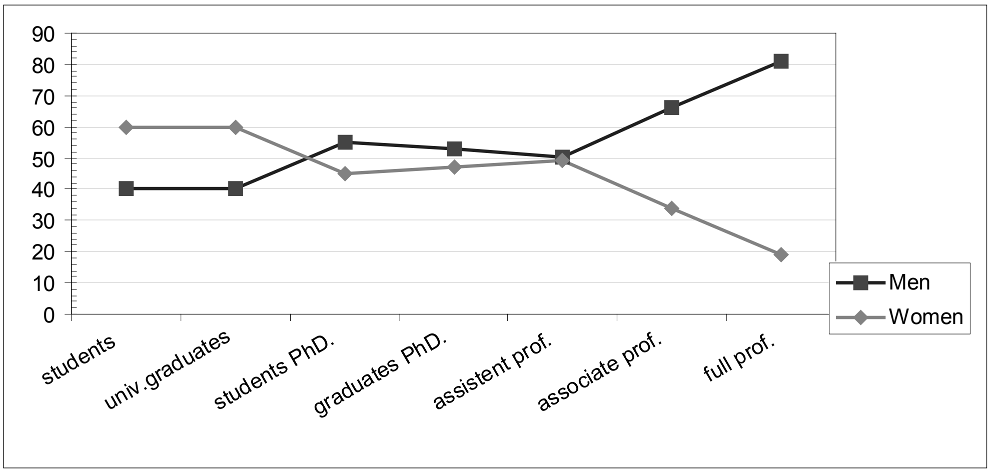


Source for EU: EUROSTAT (New Cronos), WiS database, Reference year
Source for Slovak: Separate of the Yearbook of Education in SR 2001, The Institute of Information and Forecasting on Education 2002, (Note: Students' and doctoral students' data are from 2001, university lecturers' data are from 1999)

As the graph reveals, the 'scissor' development of men's and women's academic careers in Europe has a global validity. A comparison with EU countries unveils a vertical segregation as part of an academic reality, and it is typical not only for Slovakia. Its presence is also seen in other well developed European countries. While in Slovakia the distribution of individual qualification levels is changing step by step, the character of distribution in the EU countries is more continuous.

Graphs 3 and 4 show that the greatest shifts occurred at the beginning of academic careers in the period 1999 and 2006. Women in 2006 represent a higher proportion of the total number of university students and graduates. A certain breakthrough point is evident in doctoral studies. PhD study represents a critical period for women and for their professional start in an academic field. This fact is linked mainly (but not only!) to women's life cycle. At the 'assistant professor' level, the gap between men and women closes again. The graphs also show that in comparison to 1999, the difference between men and women in these posts is smaller. The subsequent development of the graph implies further 'scissor' development.

Graph 4. Comparision of men and women academic careers in Slovakia in 2006



Source: The Institute of Information and Forecasting on Education, http://www.uips.sk/statis/index.html

There is a very slight 'gender' shift in the highest academic posts recorded in 2001 and 2006. The following graph maps the number of university teachers since 2000, and proves this fact. The proportion of female university teachers oscillates at the level of around 10-15 % for a long time. A distinct change was recorded in 2006, because the proportion of female professors climbed up almost to the level of 24 %. However, it may be too early to state whether this change led to a start of a continuous growth in the number of female university professors, or whether it is the result of a synergistic effect, combining several factors.

Due to the existing absence of detailed information concerning female professors by field of study, we cannot determine if the quantitative growth in the number of women professors copies the existing horizontal gender segregation, or if even in this case there is a tendency of some kind towards a more balanced situation with respect to men. When the proportion of male and female students by fields of study is taken into consideration, we can assume that the structure of female professors almost reflects the structure of 'male and female study fields.'

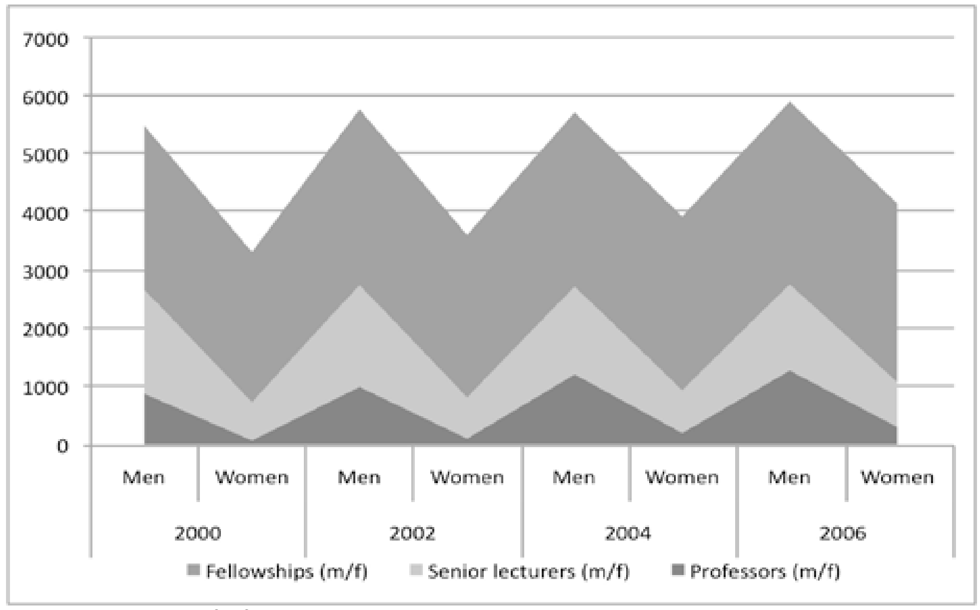
We are unable to complete this section with information on the distribution of women organisational hierarchy at universities at present because of the absence of relevant data. It is commonly known that among all universities in Slovakia, only two have female chancellors (rectors). One is at a state university (Matej Bel University in Banska Bystrica) and the other one is at a private university (Public University for Economy and Public Administration in Bratislava).

WOMEN IN SCIENCE AND TECHNOLOGY

The field of science and technology in Slovakia represents a quantitatively small part of economic and social life. According to the latest statistical data from 2005, the total number of employees in S&T was 22 294, of which 17 526 were researchers. After a re-count on the FTE (full time equivalent), the research field comprises 14 403 people, of which 10 920 were researchers.

Statistical data on human resources in S&T since 2001 do not indicate expansibility in this area. During this time the total number of employees increased by about 600 people, however, the re-count on FTE shows a quantitative decrease. The decrease was observed mostly in the natural, medical and partly the agricultural sciences. On the other hand, the greatest increase in human research capacity was recorded in the humanities, however, the growth did not offset the fall in the previously mentioned fields. The human research capacity dropped mostly in the entrepreneurial sector, which could be seen as a very adverse signal with respect to the aim of building the knowledge-based economy. The same fall in the number of people and in research capacity was recorded in the public sector. A major increase was registered only at universities (as a result of the increasing number of universities).

Graph 5. A gender structure of university teachers

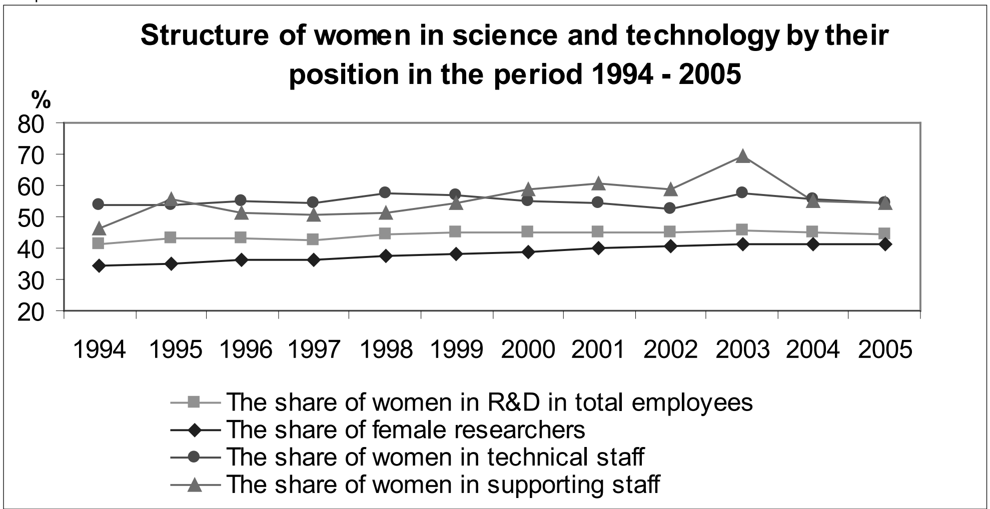


Source: The Institute of Information and Forecasting on Education, http://www.uips.sk/statis/index.html

The adverse development in the research personnel capacity reflects the same tendency in the financing of research. The S&T expenditure between 2001 to 2005 increased in absolute terms by 50 million euro, however, the GDP contribution on S&T in the period mentioned declined from 0.63 % to 0.51 % of the GDP. This value is far below the 3 % GDP contribution to research, which is the target of the EU. The biggest drop in S&T expenditures (as well as in research capacities) was noted in the business sector. In 2001 the business sector funded more than 67 % of the total expenditures on research, however in 2005 it dropped by 20 percentage points to the level of less than 37 %.

The share of women in research and development is significant and relatively stable due to high numbers of women present in the field. The total proportion of women in S&T varies around 40-42 % from the total FTE capacity. However, significant differences exist among the groups of research employees. The smallest proportion is in the group of researchers. As the graph below shows, the number of female researchers stabilised after the slight growth during the 1990s. The current situation likely represents the critical threshold.

Graph 6



Source: Statistical Office of the SR, Yearbook of Science and Technology 2001, 2006

A continuous growth in the number of female researchers might be considered positive when considered on its own. However, experiences with similar trends in other labour sectors should keep us detached when assessing this fact. The increase in numbers of female researchers could be influenced by certain factors, which could make the intensity of this trend doubtful. A yearly decline in S&T expenditure share of GDP could subvert the public attractiveness of science and the status of researchers in society. As a result, women could take up posts which are not attractive for men anymore, whilst men could shift to the better paid positions. (V. Krivy, p.105)

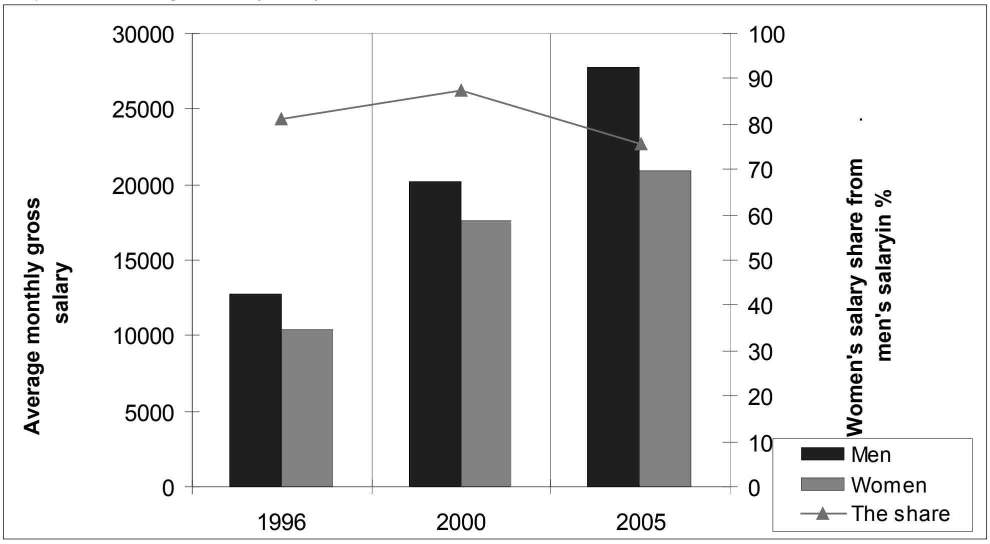
A GENDER WAGE GAP – A PROBLEM OF SCIENCE AS WELL?

The gender wage gap in Slovakia is one of the most extensive among the EU countries and has even increased in the last few years. While in 1997 women earned 21.5 % less than men, in 2006 the gap increased to 26.9 %.[6] The increase in the gender wage gap was caused mainly by more intensive dynamics in the male salary growth. On average, the number of female working hours is lower than male, and the female flexible salary rate is also lower. These facts accelerate the enlargement of the gender wage gap. Regarding age, the least difference is seen in the age group up to 24 years old. At the opposite pole - in the age group of 35-39 women are earning 35 % less than men.

The latest data from 2006 confirm that the difference between male and female salaries is a result of structural factors: partly horizontal as well as vertical segregation. Women are concentrated in low pay industries (services, education, health …). Even at executive and managerial positions, on average the gap between men and women is about 33 % for the same post. More detailed analyses revealed[7] to what extent the difference in salary could be explained by personal characteristics (age, gender), labour market characteristics (type of contract, period of employment) and company characteristics (industry, size, region, ownership). In the non-business sector, the percentage explanation of the salary difference by these characteristics was higher than in the business sector: 57 % compared to 34 %.

Education is a significant factor in salary differentiation. It turns out that among men and women education influences salary differentiation differently. In the case of men the relation between education and the wage level could be viewed as linear (meaning the better the education, the better the wage). This is not true in the case of women: higher education level does not bring the same advantages as it does for men. The greatest difference in the salary range of men and women is in the highest posts. Men and women with the highest education comprise the most important employment segment of research and development.

Graph 7. The average monthly salary of researchers and scientific workers (m/f) in 1996, 2000, 2005*



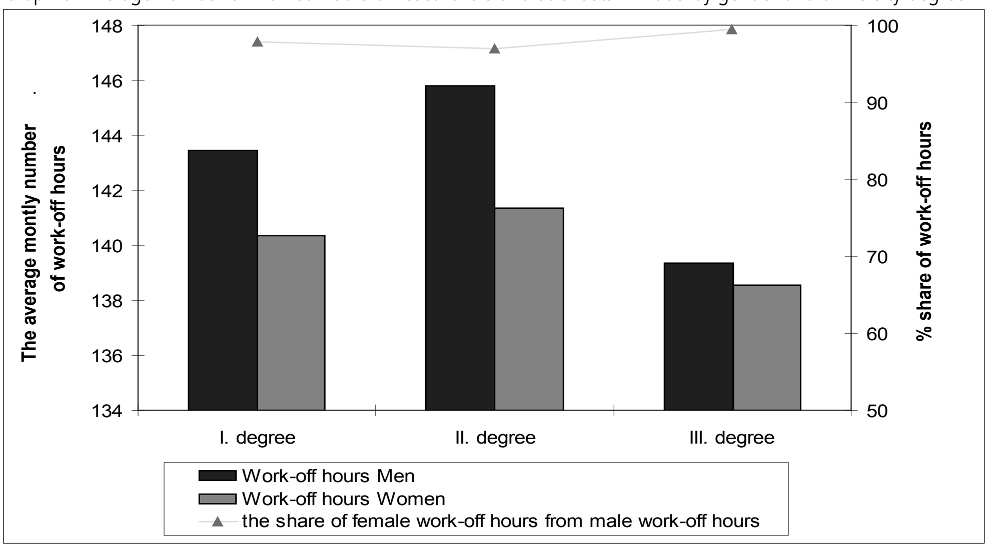
**Workers with more than 154 working hours per month*
Source: Statistical Office of the SR, Yearbook of Science and Technology 2001, 2006
Note: Men's salary=100 %

Although the data in the graph cover a slightly short time frame, the pay gap between men and women is evident and it has increased over the last few years. The trend might show some side steps, however, at the end, the wage difference between men and women opens the 'scissors' more.

The latest published data on the structure of salaries distinguish between three levels of university education, and thus offer the possibility of a more detailed comparison. The number of hours worked is considered one of the causes of the pay gap, because women work considerably shorter hours than men. Graph 8 shows a comparison of the average number of hours worked by men and women in the scientist employment category in 2005. A significant difference in hours worked by men and women could be seen at the level of 1st and the 2nd university degrees, whereas the 3rd level shows a very small difference in hours worked.

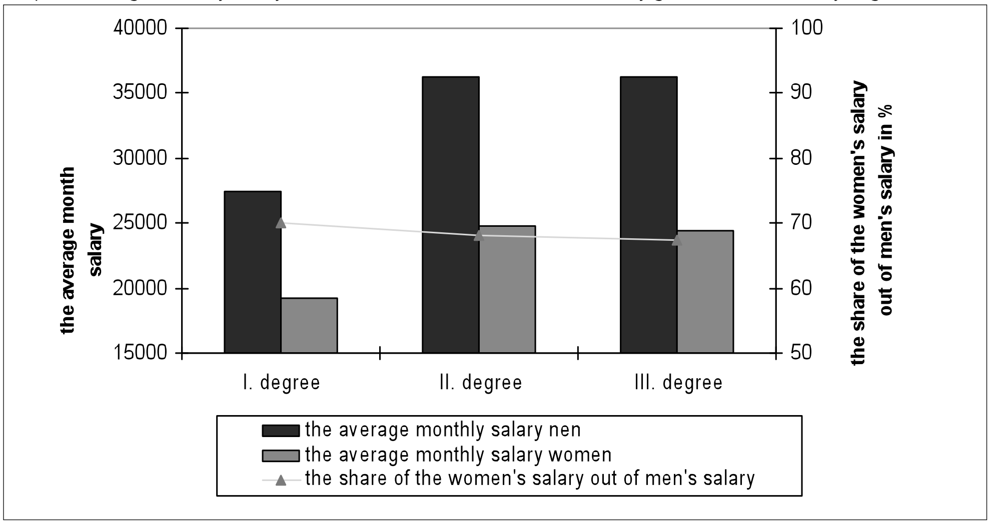
The minimum difference in the number of hours worked between men and women should imply a minimum difference in the pay gap at this level of university degree. This prediction did not come true. The differentiation flow of male and female salaries differed and did not correspond to the differentiation flow of the number of hours worked.

Graph 8. Average number of worked hours of researchers and scientists in 2005 by gender and university degree



Source: Statistical Office of the SR, Yearbook of Science and Technology 2001, 2006
Note: The average number of male worked hours = 100%

Graph 9 Average monthly salary of scientists and intellectuals in 2005, by gender and university degree level



Source: Statistical Office of the SR, Yearbook of Science and Technology 2001, 2006
Note: The average number of male worked hours = 100%

Graph 9 confirms the fact that the greatest pay gap between men and women exists at the highest educational levels. Obviously, the number of hours worked does not have a crucial impact on the wage differentiation, but there are other explanatory factors. It is worth quoting a statement by J. Vecernik in this context: 'for women the highest education is not an advantage either in comparison with other, less educated women, or in comparison with men. Education as an indicator of salary plays a different role in the case of women as well as of men. In the case of men the individual explanatory factors act independently and can strengthen each other, but in the case of women these factors act only in mutual combination. It means that handicap in one area (for example age) can not compensate or be substituted by another factor – for example by higher education' (J. Vecernik, p.119). The lack of data does not allow analysing the influence and strength of the individual factors on the gender wage gap more precisely. Regardless, the existing analyses indicate that in the case of intellectuals (m/f), the wage differences are the result of an existing hierarchy, or better still of 'the attrition effect' (meaning the higher the position - the smaller the proportion of women).

THE SCIENCE AND THE PHENOMENON OF PRESTIGE AND TRUST

One of the typical problems of science is its slender connection to everyday life. This fact causes many prejudices about the 'usefulness' of science for society. Hence one of the Eurobarometers examined the prestige of scientists, the trustworthiness of scientific findings and many other relevant problems. The abovementioned Eurobarometer[8] survey was conducted in 2002, i.e. before Slovakia joined the EU. The survey comprised two country groups: the old EU15 (further CC15) countries as one group, and the 10 new candidate countries together with Bulgaria, Romania and Turkey (further CC13) as the other one. The medical profession scored the highest credit (in terms of respect) in both groups. The profession of scientist came in second (the profession of 'scientist' was not further specified). Interestingly, higher prestige was given to this profession in the CC13 group. The given results were interrelated to the respondent's level of education as well as his/her level of knowledge about science. Respondents with higher education assigned the highest prestige to the scientific profession, whereas respondents with lower education claimed either the medical or engineering professions to be more attractive. From the public point of view in Slovakia, respect for the scientific profession was relatively high. More than 62 % of respondents rated the scientific profession as the most prestigious one. It was the highest rate after Cyprus and Turkey. On the other hand, the scientific profession was the least respected in Lithuania – only 40 % of respondents opted for it.

More significant differences between countries were identified in answer to the question which disciplines can be considered scientific and which ones not. Generally, natural sciences are considered to be more scientific than humanities. Only 25 % of respondents in Slovakia labelled humanities as scientific, and it was the second worst result after Malta. In Slovakia, natural sciences were considered as scientific in more than 60 % responses, which represented more than the average among the CC13 countries.

Results for the credibility of various professions in case of crises and catastrophes were in favour of scientists. According to the results, in case of an emergency in Europe, a generally higher credibility was given to the scientific profession than to any other. In the CC13 group, more than 39 % of respondents would trust scientists in case of a crisis or a catastrophe. They would expect an explanation from them and they would believe them. More than two thirds of respondents – 64 % - claimed scientists were in the group of three most trustworthy subjects whom they would believe (doctors 50 %, environmental organisations 42 %). In terms of trust in governments and other governmental organisations in the event of a crisis unfavourable results were achieved in general.

The abovementioned research also provided interesting findings about the attractiveness of science. Information gathered from various countries confirmed a link between the decline in interest in science and the situation in science itself, or in its financing. Although the situation in various countries was different, this allows them to be divided into several groups. Slovakia formed one group with Romania, Latvia and Estonia. Respondents from these countries clearly expressed the opinion that interest in science was declining among students and young people in general. Young people in particular, in contrast to older respondents, more often than not expressed a decline in interest in science. The most often stated reasons for this trend were salaries and career opportunities (in CC15 group), while the CC13 claimed insufficient training for scientific work at schools as the most important factor.

Despite this stated decline, a rather optimistic forecast could also be seen. According to the respondents, the importance of science will increase both in the field of economic development and due to the need to deal with the threat of pandemic diseases. In this sense, men showed greater optimism than women.

The survey also addressed questions such as why European research is not capable of exploring ideas such as biotechnologies or the internet and why the majority of Nobel Prize Laureats work overseas and not in Europe. Very often the respondents did not know the answers to these difficult questions. As the most common reason for the marginal position of science in Europe, respondents mentioned weak cooperation between particular countries and between scientists and industry. Although the big differences between the CC13 and CC15 were not identified, one interesting fact was evident. In CC15, respondents wanted to encourage more women into science as a solution for improving European research (67 % of the respondents). In CC13, only half of the respondents chose this option.

INNOVATION ENVIRONMENT, INNOVATION POTENTIAL AND STRATEGIC POLICIES

The present situation in research and development in Slovakia has in many ways been stigmatised by the structure and development of past industrial production, mainly heavy industry. Moreover, after 1989 it was necessary to tackle the problem of an industrial transformation, which hit the major part of the industry. Industrial enterprises dealt with low efficiency and lack of innovation. Due to insufficient support for the implementation of innovative technologies, growth in the small and medium business sector was relatively slow. Private sector demand for S&T products is small, which limits economic potential primarily dependant on the implementation of new technologies. In terms of patent applications, Slovakia belongs to 5 least developed countries within EU25. In 2005, Slovakia and Portugal took the lowest place on the scale of most innovative EU countries. Productivity of enterprises in terms of innovation is very low and is closely connected to problems of low employment rate in the sector of high-tech services. There are at least two reasons for this: low activity and competitiveness of domestic innovation capacities and low attractiveness of Slovakia for the key multinational groups with a major innovation potential. Almost half of all S&T capacities are located in Bratislava. The most critical absence of S&T infrastructure is in eastern and southern Slovakia. An increase in the number of new universities beside traditional education centres has brought a growth in the size of academically educated and qualified workforce. However, the expected effect of cooperation between universities and business research centres has not come about.

The government's programme National Reform Programme of the Slovak Republic for 2006-2008, prepared in 2005, which was tied to the National Lisbon Strategy, states that 'Slovakia has relatively good S&T potential, but due to weak and insufficient state support the quality of S&T is lagging behind the most developed European countries.'[9] . The programme mentioned defines five priority areas, which should support the growth of creativity potential of the Slovak economy:

- education
- employment
- information society
- **R&D and the innovation**
- business environment.

Other three sub-areas are defined within the S&T. One of them[10] is education and training of excellent scientists. Improvement in the human resource development is understood as part of S&T infrastructure, with focus on graduates and post-graduates. Two specific measures would support the training and excellence of scientists. The first one is 'The *Mobility support system for scientists on the national and international levels*'. The public's perception of science is considered very important. Thus the Programme of public reforms comprises the second specific measure, the '*Programme to popularise the science in the society*.' The aim of this program is to increase information exchange within a scientific society, but mostly to increase the interest of young people in research and science. The programme will focus not only on universities, but also on primary and secondary schools. However, the programme itself does not comprise any information on how to strengthen women's position in R&D or how to overcome the gender stereotype of study preferences. Likewise, the *'Report about the progress in the implementation of the National program of the Slovak republic* *reforms for 2006-2008',* prepared in 2006, did not mention the problem of the role of women in science and technology: neither in the part about modern educational policies, nor in the part related to science and innovation. The whole problem related to women in science has been squeezed into general statements about reconciliation of family and work life, and about need to support gender equal policies and equal opportunities. It can be seen as promising that in its Program Declaration the present government has declared to establish institutional structures to support gender equality as well as to develop strategy for gender equality.

POSITIVE EXPERIENCE FROM PRACTICE – GENDER MAINSTREAMING AS AN AIM

Despite the facts mentioned, which reflect low gender sensitivity in Slovak society, several activities have been achieved which help to overcome the existing unfavourable situation. Even though these activities are not directly targeted at R&D issues, their results might help to change the current status quo. An example could be the twining project *Reinforcing Administration Capacities in the Gender Mainstreaming Area*' carried out by the Ministry of Labour, Social Affairs and Family in 2004-2005. In terms of gender equity, Slovaks received valuable advice from the French experts coordinating the project. More than 400 co-workers from various public areas were involved in the project, which in terms of sample size represented a particularly major issue. The participating representatives were from national, regional and local levels, from governmental and state services, trade unions, universities, as well as from non-governmental organisations. The process of the project was characterized by a high level of enthusiasm of the participants to transfer their project experience into practice. The results of the project were drafted in the booklet Good Practice in Gender Equality', summarising experiences from the gender equality field in Slovakia and in some other European countries. Activities like this could be a potential source for new initiatives in the implementation of gender equality on all levels.

SUMMARY – WHERE ARE WE AND WHERE ARE WE HEADING?

Human and financial resources are two crucial parts of high quality and efficient science. The share of highly qualified scientists and research staff of the total labour force in Slovakia is one of the lowest in Europe. The proportion of women among highly qualified scientists is about 50 %, which is comparable to the majority of EU countries. In terms of the structure of employees in S&T, the proportion of researchers in Slovakia is one of the highest.

A more difficult and adverse situation concerns the financing of S&T. The latest European Commission report from 11 June 2007 Towards a European Knowledge Area states that since 2001 R&D expenditure in many European countries has been increasing. The reason for this was to achieve the level of S&T expenditure of 3 % of the GDP. The increase in S&T financing reached almost 30 % in several countries (for example in Slovenia). The report also mentions a few countries where S&T expenditure dropped, with Slovakia having the biggest decline of 22.9 % recorded between 2001-2007.[11] On top of that, the public expenditure reduction was followed by a decrease in private sector expenditure.

Taking this into account, the qualitative and quantitative indicators of scientific productivity in Slovakia are not superlative, and in many ways follow the decline in the financing of science. Let us take the example of the proportion of Slovak scientific publications in worldwide production. Slovakia's share in 2002 was 0.23 % which cannot be considered a satisfactory result. More significantly, in comparison to year 2000, it represents an average yearly decline of -1.6 %[12] ....

Positive correlation between expenditure and scientific output is also evident in many other countries. An evaluation of scientific output should be related to certain national specifics of each country, namely to the orientation towards specific scientific disciplines. There are scientific disciplines which can be identified as more productive in publishing (such as life sciences or clinical medicine) and those with lesser publishing output (such as computer and engineering science). Currently, there are relatively big differences between old and new EU member states in terms of their scientific orientation. Social sciences and humanities apart (their share is in general relatively small), in Slovakia the most developed fields are chemical, mathematical and physical sciences and astronomy. The limited orientation towards sciences with greater publishing output might influence Slovakia's position in the scientific publishing ranking.

Even less impressive facts about Slovakia concern the patent applications field. In 2003, Slovakia was in the group of countries with the smallest number of patent applications (into EPO) per 1 million inhabitants. The EU leader was Germany with 312 patent applications per 1 million inhabitants. The EU average represents 127 patent applications. Slovakia was towards the bottom of the ladder with 6 applications, with only 6 EU countries being even lower. Switzerland has the strongest position with 426 patent applications.

These facts raise many questions, such as: Why are the results in S&T not able to follow the trends in other European countries despite the numerous official declarations about the need to build a knowledge-based economy and knowledge-based society? And why do the results even show negative tendencies in many respects? Many questions still remain unanswered.

However, in the last few years advancement in the gender equality process in Slovakia has been achieved. In spite of this there still does not exist a sufficient institutional and coordination mechanism for the gender agenda. The gender agenda does not have any status, institutional background and most importantly – a clear vision. A generally admitted fact is the weak cooperation between the entities involved: the government, the parliament, trade unions, non-governmental organisations, gender specialists and other subjects. As an indication, the conceptual documents in the sphere of science and research policy do not reflect the need to overcome the existing gender stereotypes and to support women's position in S&T. Two important documents can serve as an example: neither in the latest draft of the *National Strategic Reference Frame for 2007-2013* nor in *The S&T Operational Programme* was there mention of a programme or a scheme to motivate and support women in scientific careers. Only the anti-discriminatory nature of the proposed priority axis is emphasized in the documents. Gender equality is recognized as a horizontal priority and is defined very generally, in connection with the aim 'to improve women's situation'. Similarly, neither do the proposed priorities to support young scientists distinguish between the divergence in career development of men and women.

The facts outlined indicate that women's path into science, compared to that of men, is still highly circuitous and with many setbacks. And it seems that it will stay that way for a long time to come…

Endnotes

1 The agreement about the elimination of all forms of discrimination against women was adopted in New York on December 18, 1979. It was signed later by former Czechoslovak Republic in Copenhagen on July 17, 1980. As a result of succession after the former Czech and Slovak Federative Republic, Slovakia became the contracting party of the agreement on May 28, 1993 with retroaction from January 1, 1993. The Optional protocol to the Convention was adopted in New York in 1999, and the Slovak Republic signed and ratified it in 2000. With adhesion to the convention and to the additional protocol, individual countries obliged themselves to implement and administer mechanisms of the enforcement of the equality between men and women. They also obliged to avoid gender discrimination in all aspects of social life.

2 For comparison with other countries we can claim, that to the opinion of women's role to take care of the household and men's role to earn the money, only 7.6 % of respondents from Sweden, 12.3 % from Netherlands, 17.7 % in Great Britain but almost 50.6 % in Czech Republic agreed. (ISSP 2002, cited according to M. Brahma: Gender equality and the labour market in Slovakia, In: Slovakia on the road to gender equality, Ed. M. Piscova, ERPA-SU SAV, Bratislava, p.43

3 ibid, see p.45

4 According to the latest data, the proportion of men on parental leave in Slovakia is very small and varies about 2 % of all beneficiaries.

5 There are twice as many women than man studying in the external form. Reasons for this situation could be found in the new legislative norms adopted after year 2000. These norms require anyone wishing to work in the government sector to have a university education. This sector is dominated by women.

6 Source: *The structure and the salary differentiation betwen 1997 – 2006, http://www.statistics.sk/webdata/slov*

7 Bastanovsky, T.: The Gender salary gap, TREXIMA Bratislava, presented at the workshop "The differences in the remuneration of men and women", Nitra, 28.a.2006

8 Candidate countries Eurobarometer, CC-EB 2002.3 on Science and Technology, http://europa.eu.int/comm/public_opinion

9 National reform program of Slovak republic for 2006-2008, October 2005

10 Another two priorities in S&T are 'internationally quality level research connected with business sector' and 'the efficient public support of the entrepreneurial activities focused on the research and innovation'.

11 Source: Key Figures on Science, Technology and Innovation – Towards a European Knowledge Area, EC, June 2007.

12 According to the source, the situation in Czech Republic was different and between 2000-2004 was achieved the increase of 3.3 % in the share of the scientific publications.

Wasted Talents or Participation of Women in Science, in Educational Sector and the Academic Personnel of Slovak University of Technology in Bratislava

Daniela Velichová

The Slovak Republic is not among the countries active in applying the policy of equal opportunities, and Slovak society is not sensitive to gender issues and gender equality. The position of women in science in Slovakia corresponds to the attitude of its society. In research and development, a total of 22 294 persons were employed in 2005, including 18,167 university graduates, 8,520 with higher academic qualifications ('DrSc.', 'CSc.', 'PhD.', 'Dr.', 'prof.', 'doc.'). Of this total, 9,662 persons were women, of whom 7,381 were university graduates and 2,961 had higher academic qualifications. The development of women's participation in science and research since 2002 is illustrated in the graphs in Fig. 1 and Fig. 2, the percentage of women participation is shown in Table 1.

Fig. 1 Numbers of researchers in science and development, university graduates or with higher qualification.

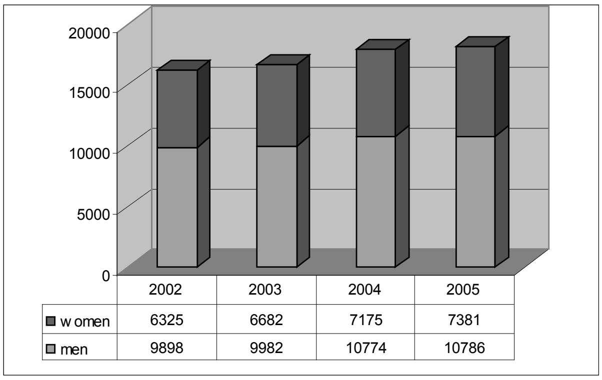
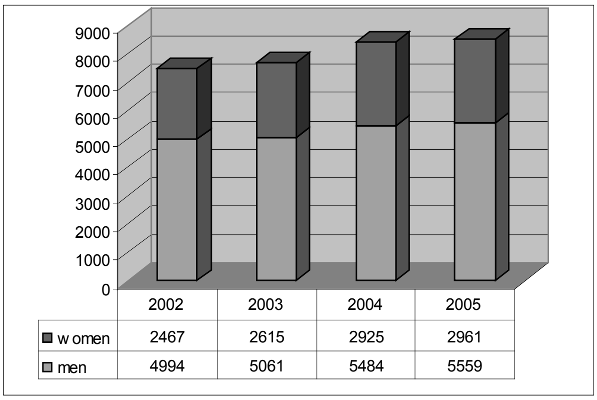


Fig. 2 Numbers of researchers in science and development with higher qualification.



Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

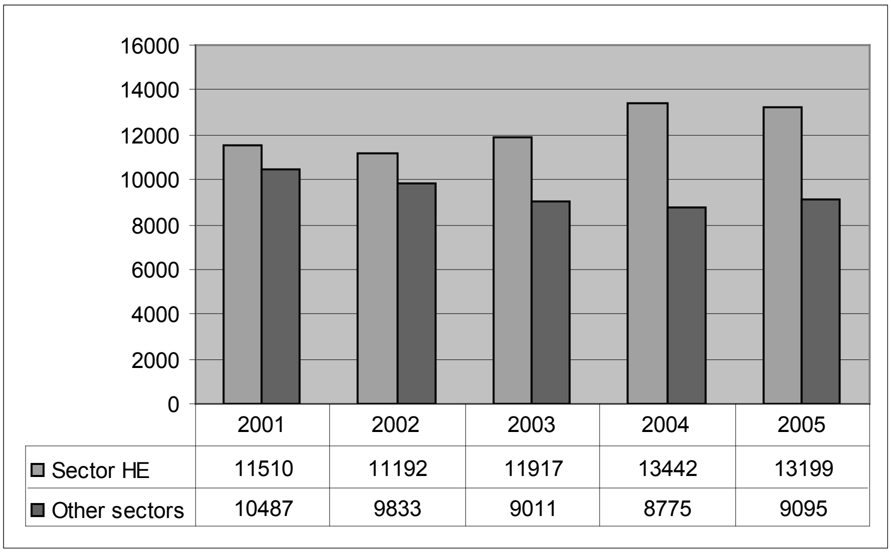
Table 1. Percentage of women among all workers in science and research.

Education	2002	2003	2004	2005
HE together	38.99	40.10	39.97	40.63
Higher qualification	33.07	34.07	34.78	34.75

Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

Statistical data on the horizontal distribution of scientific and research workers - both men and women - in the SR, by NACE classification, document that in 2005 the majority of them worked in the higher education sector (59.2%); in terms of the legal statute of the employer organisation, the majority was working in public institutions (58.7%); and in terms of ownership, most were employed in state-owned organisations (83.7%). With respect to distribution by different sectors (business enterprise, state/government, private non-profit, higher education), the majority of men and women scientists and researchers worked in the higher education sector. The development in these areas since 2001 is presented in Fig. 3. Members of academic staff at universities therefore represent a considerable majority of all persons working in science and research in the SR, either as university graduates with degrees or with higher academic qualifications (Tab. 2). In this sector the overwhelming majority of young talented people starts their scientific and research career by graduating from university with a PhD degree.

Fig. 3 Numbers of scientists (men and women) in higher education and in other sectors together.



Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

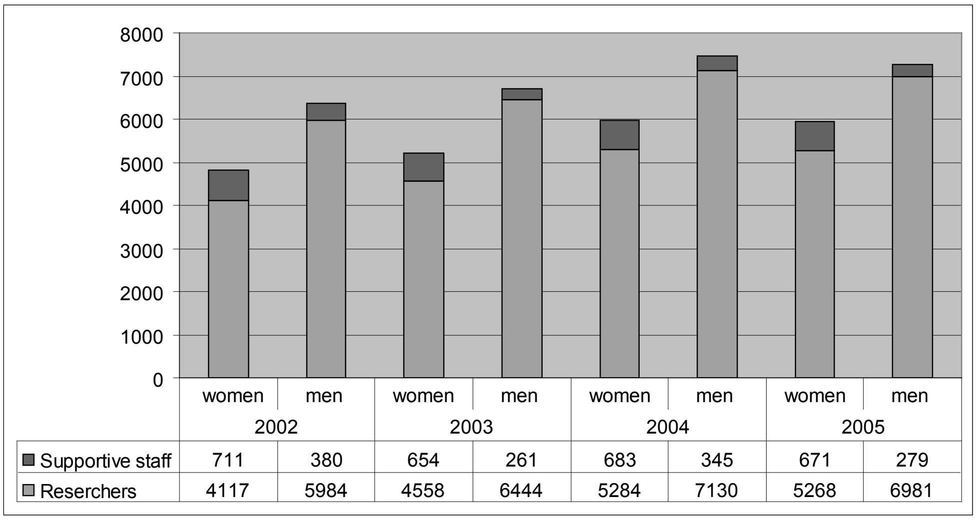
Table 2. Numbers of employees in science and research in the position researchers by sectors.

Sector	2001	2002	2003	2004	2005
Business enterprise	2,715	2,557	2,255	2,181	2,414
State (government)	2,761	2,722	2,844	2,706	2,845
Private non-profit	0	5	7	53	18
Higher education	10,447	10,101	11,002	12,414	12,249

Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

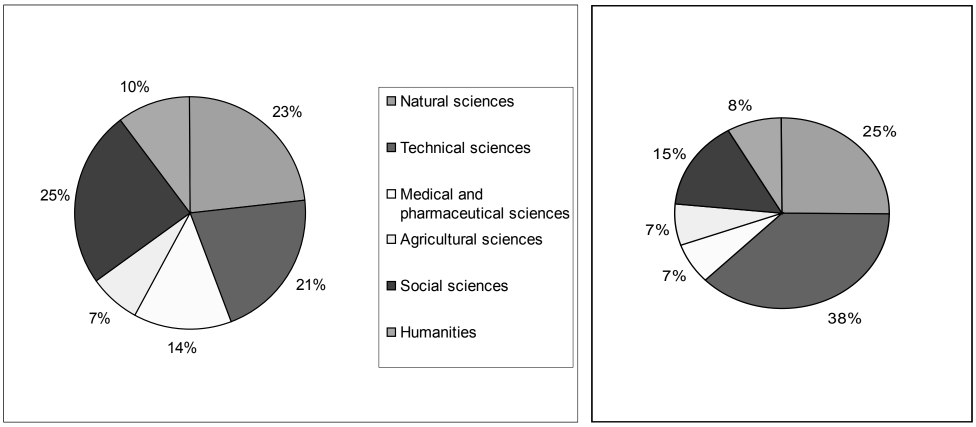
The participation of men and women among research workers in the higher education sector and their distribution by occupation among support and technical staff, and among scientists and researchers who are members of academic staff, in the SR is given in Fig. 4. The data presented clearly shows that although the numbers of women present in science and research are approaching the numbers of men, women are still more likely to be concentrated in larger numbers among support and other staff.

Fig. 4 Scientists and researchers (men and women) in HE sector by occupation.



Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

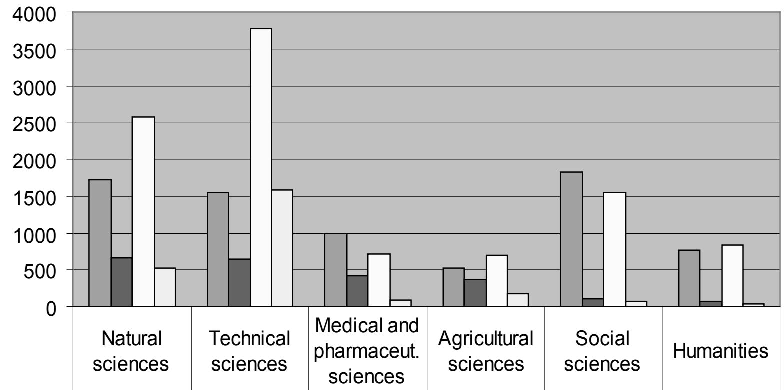
Fig. 5 Percentage of women researchers (left) and men researchers (right) by fields of science.



Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

Technical sciences are traditionally fields with the largest numbers of scientific and research workers (5,649). While the majority of all men in science work in this field, as much as 38%, only 21% of all women researchers are employed in this sector (Fig. 5.). A quarter of all women scientists work in the field of social sciences, where only 15% of all men can be found. Natural sciences, humanities and agricultural sciences are relatively equal with respect to gender balanced percentage of participation, while in medical and pharmaceutical sciences the percentage of women's participation is twice as big as the percentage of men. The total head counts of men and women researchers and scientists distributed by scientific fields and types of occupation in 2005 are shown in Fig. 6.

Fig. 6 Research and development personnel in head counts by occupation and fields of science.



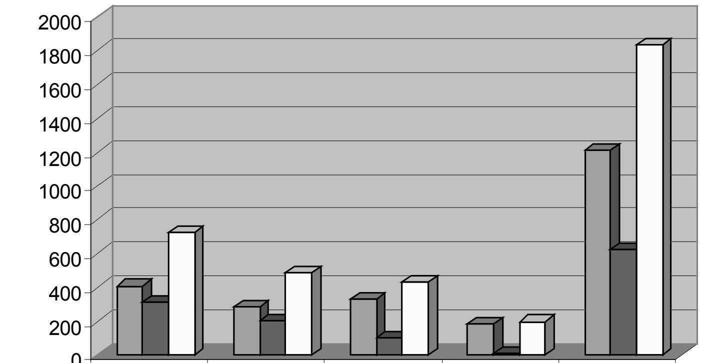
	Natural sciences	Technical sciences	Medical and pharmaceut. sciences	Agricultural sciences	Social sciences	Humanities
Women researchers	1715	1546	1000	529	1824	767
Women supportive staff	659	649	418	365	113	77
Men researchers	2566	3771	720	697	1553	838
Men supportive staff	519	1583	95	182	69	39

Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

In the higher education sector, the horizontal distribution of scientists by academic qualification or pedagogical post would be interesting, however, gender segregated statistics of academic staff by academic positions at universities are not publicly available, or reported. The Ministry of Education of the SR should adopt practical steps in this field in order to prove its positive attitude towards the implementation of gender mainstreaming strategy and the policy of equal opportunities in science, and should provide access to relevant statistical data, or make efforts to focus on monitoring the development of academic staff composition in the SR in relation to the gender balance and the gender sensitive approach.

The situation at the largest university in Slovakia, the Slovak University of Technology in Bratislava, is not very optimistic for women. There is only one woman present in the university leadership in the position of a bursar, and not a single woman among the 31 members of the University Scientific Board, and there are only 7 women among the 42 members of the Academic Senate, while 4 of them are students representing the Student Parliament of STU. Equally, there are only 3 women among the 15 members of the Administrative Board of the university, one in the position of a personal assistant and one student representative. In the leadership of the individual faculties, only 5 women from the total number of 37 deans and vice-deans appear in the position of vice-deans. Women form more then one third of the STU academic staff. Horizontal segregation – the participation of women in higher posts of the academic ranks proves the weak position of women, who appear mostly in the positions of assistants and assistant lecturers (see Fig. 7). Data from 2002 cited in the Enwise report are presented in Fig. 8, to compare the position of women at STU and to show the development of situation there.

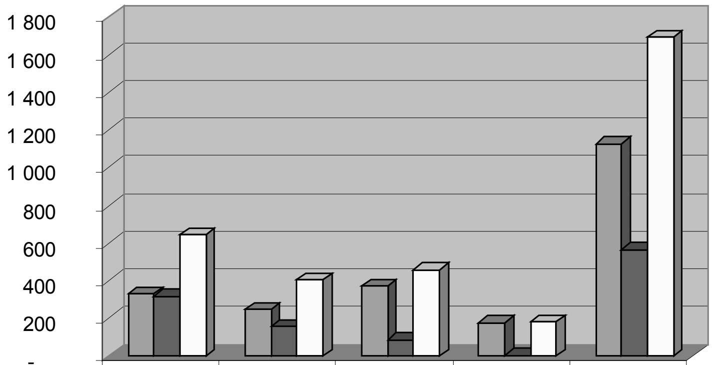
Fig. 7 Distribution of academic personnel at STU in Bratislava by qualification, year 2007.



	Mgr., Ing., RNDr.	PhD., CSc.	doc.	prof.	total
Men	410	285	332	185	1212
Women	313	200	100	12	625
Total	723	485	432	197	1837

Source: webpage of STU and its faculties

Fig. 8 Distribution of academic personnel at STU in Bratislava by qualification, year 2002.



	Mgr., Ing., Dr.	PhD., CSc.	doc.	prof.	total
Men	329	248	371	178	1 126
Women	318	155	88	5	566
Total	647	403	459	183	1 692

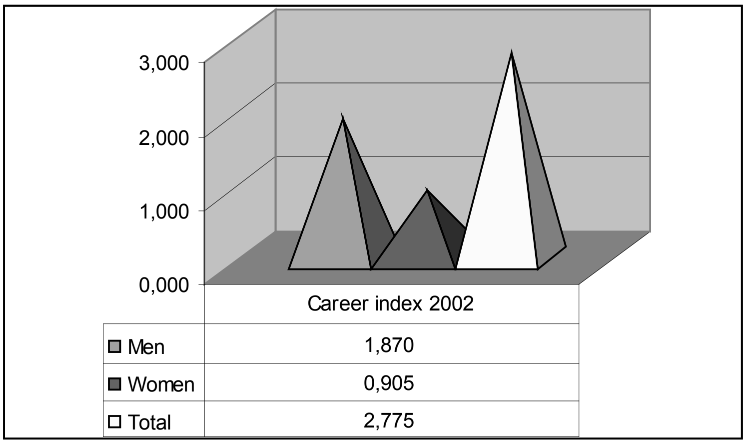
Source: webpage of STU and its faculties

It is not necessary to stress what rights and duties follow from this position for women - a lot of hard and time-consuming work for inadequate salaries, a lack of time to develop personal professional careers, scientific growth and work on international projects, no appreciation from society, unrealised scientific ambitions, untapped abilities and knowledge, wasted talents and an unprecedented loss of the knowledge potential of one third of university academic staff. Not only Slovak science or the European Research Area, but not even humankind as such can afford such a waste of existing intellectual potential.

Another interesting statistical indicator is the success rate of young people in science and technology at the beginning of their scientific careers. Comparing the numbers of men and women graduates from technical universities in the academic year 2000/2001 and the numbers of men and women students at postgraduate PhD. study programmes in the academic year 2001/2002, a career index can be obtained, expressing the percentage of STU graduates who intend to continue in further PhD studies representing the start of a successful scientific and research career in the field of technical sciences (Table 3). The career pyramids in Fig. 9 clearly show the dominant role of men. Women are forced to give up their ambitions and not to start their scientific career in the most productive age, if they wish to fulfil their irreplaceable reproductive duties, which remain on the personal level of private struggles and problems, and are still not a public issue in the interest of the society. Yet society has the duty, and the ability, to directly support and develop not only the talents of all young people, but also natural reproductive processes by adopting a reasonable social policy and strategy of gender mainstreaming, gender equality and equal opportunities.

Another interesting statistical indicator is the higher education gender progression ratio HEGPR, indicating the ratio of career indexes of men and women to the common career index in total, so in fact it is an indication of the chances of men and women to be successful at the beginning of their scientific career. The ratio of higher education gender progression for men and women (HEGPR total in Table 3) indicates that in the academic year 2001/2002 the success rate of men at STU was twice as high as that of women.

Fig. 9 Career pyramids at STU in Bratislava, year 2002.



Source: Statistical Office of the SR, Basic Data on Schools and School Establishments in the SR in the School Year 2001/2002

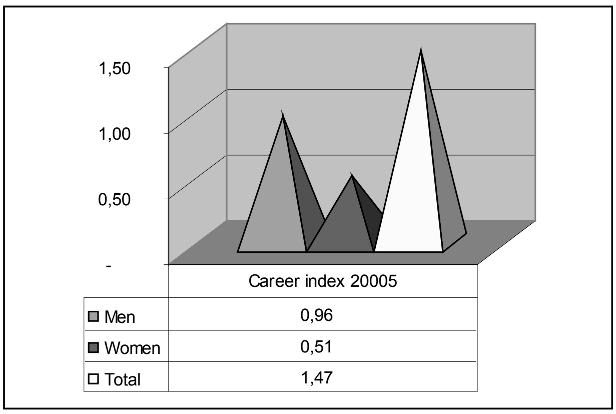
Table 3. Career index and Higher Education Gender Progression Ratio at STU in academic year 2001/2002.

	Engineers – graduates 2000/2001	PhD. students 2001/2002	Career index	HEGPR
Men	2287	62	1,87	0,67
Women	1028	30	0,91	0,33
Total	3315	92	2,78	2,07

Source: Statistical Office of the SR, Basic Data on Schools and School Establishments in the SR in the School Year 2001/2002

The situation in the academic years 2004/2005 and 2005/2006 seemed to have partially improved for women, as shown in Fig. 10. and Table 4., but it was also influenced by other factors. The total number of students in PhD study programmes in the academic year 2005-2006 decreased by 34 (the number of women by 10, men by 24), while a considerably high increase in the numbers of graduates from master engineering study programmes was recorded compared to the academic year 2000/2001, with 636 students, of whom 441 were men and 195 were women.

Fig. 10 Career pyramids at STU in Bratislava, year 2005.



Source: Statistical Office of the SR, Basic Data on Schools and School Establishments in the SR in the School Year 2005/2006

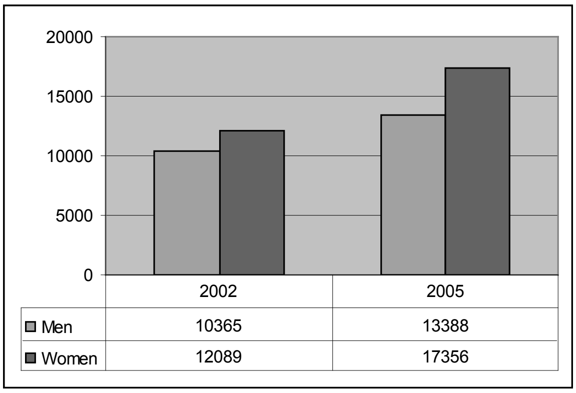
Table 4. Career index and Higher Education Gender Progression Ratio at STU in academic year 2005/2006.

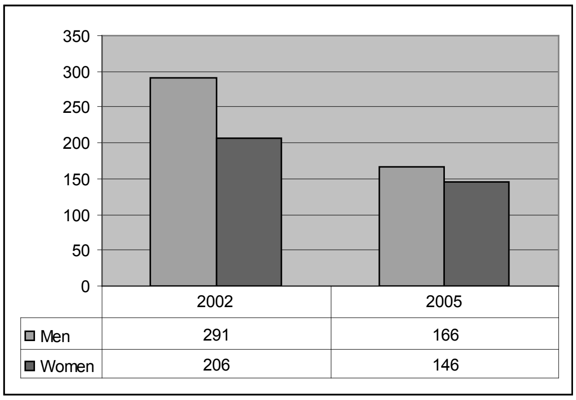
	Engineers -graduates 2004/2005	PhD. students 2005/2006	Career index	HEGPR
Men	2,728	38	0.96	0.66
Women	1,223	20	0.51	0.34
Total	3,951	58	1.47	1.90

Source: Statistical Office of the SR, Basic Data on Schools and School Establishments in the SR in the School Year 2005/2006

In total, numbers of all students in PhD study programmes at universities in the SR in academic year 2005/2006 (312) were lower than in 2001/2002 (497), though absolute numbers of graduates in master programmes (22 454 - 30 744) have an increasing tendency, see Fig. 11. The number of women among all university students in the last few years seems to be higher then the number of male students. This fact can be explained also by the unattractiveness of the positions of research and scientific workers, whose work is not sufficiently appreciated by society - it does not have the necessary prestige adequate to its importance, not to speak about the poor working conditions and insufficient financial support offered to employees in science and education. Finally, a simplified conclusion about the development in the last few years is at hand: the percentage of women among students is increasing directly in correlation with the decreasing attractiveness of science and expenditure on education and research.

Fig. 11 Head counts of university graduates (master's programmes on top, PhD programmes) in SR.

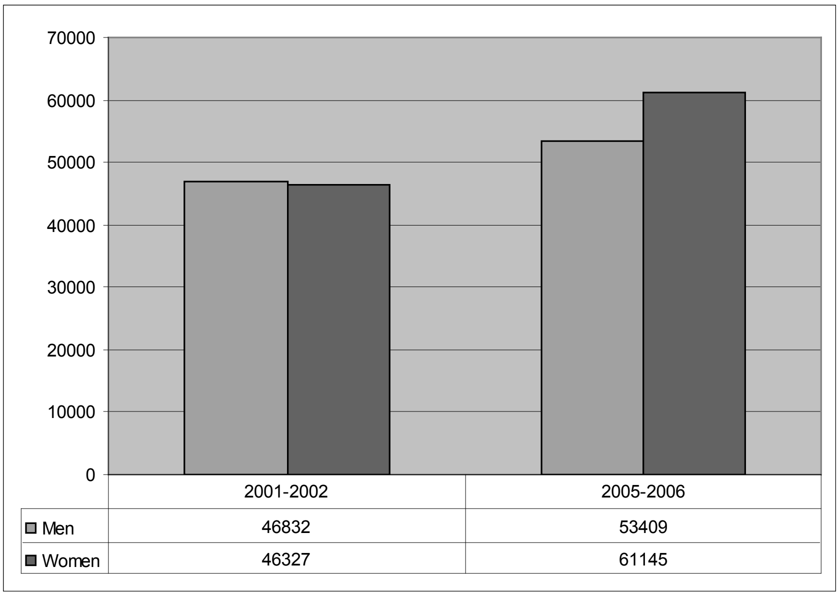




Source: Statistical Office of the SR, Basic Data on Schools and School Establishments in the SR in the School Year 2001/2002, 2005/2006

The total numbers of university students, men and women inclusive, are relatively balanced, while women are more likely to graduate successfully on the second level – from master study programmes, though fewer of them intend to continue in postgraduate studies at the third level. Therefore they are unfortunately literally almost lost as wasted potential for any future scientific career.

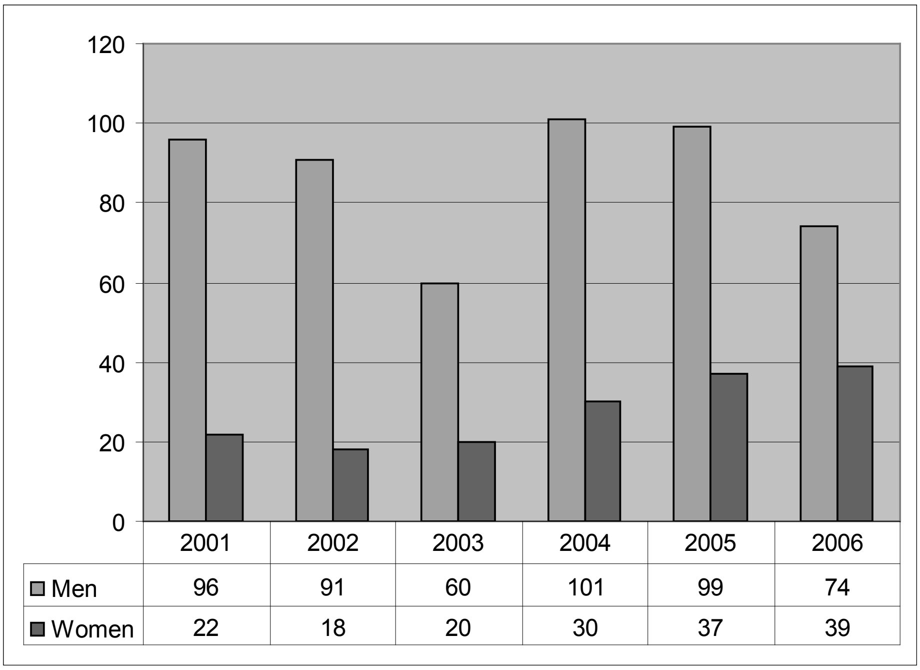
Fig. 12 Head counts of university students in SR



Source: Statistical Office of the SR, Basic Data on Schools and School Establishments in the SR in the School Year 2001/2002, 2005/2006

Positive development has been recorded in the numbers of new men and women professors, in Fig. 13 the numbers from 2001 to 2006 are presented, where the number of women reaching this highest pedagogical-scientific qualification shows an increasing tendency. The participation of women among new professors in 2006 expressed as a percentage (Table 5.) has probably come to its currently historical maximum value of 34.5%.

Fig. 13 Numbers of new men and women professors in SR in years 2001 – 2006.



Source: webpage of the Ministry of Education in SR

Table 5. Percentage of women among new professors in SR

Year	2001	2002	2003	2004	2005	2006
%	18.64	16.51	25.00	22.90	27.21	34.51

Source: webpage of the Ministry of Education in SR

Although in general we can speak about the tendency of increasing participation of women in science at the higher qualification posts, this increment is still not satisfactory and it could also be the result of an overall decrease in the numbers of scientific and research workers in all sectors, except for the higher education (Fig. 3). Here we can observe continuously increasing numbers of employees at posts of academic workers, who are required to cope with research and scientific work not as their dominant activity, but an activity additional to their prior pedagogical duties. Both of these activities are extremely demanding; they require maximum involvement and personal enthusiasm, continuous qualification growth and keeping up with development in the international context. Poor financial remuneration of academic staff under this enormous working pressure is evidence of the negligent attitude of society, government and decision-making bodies in the SR towards the situation in the sector of science and education, a lack of interest in the development of society and its future with respect to the ramifications of its knowledge potential, the growth of education and support of science, research and technology development. Table 6 shows gross domestic expenditure on research and development - GERD as a percentage of the gross domestic product - GDP, Table 7 shows the share of GERD by individual sectors in comparison to the head counts of staff in these sectors.

Table 6. Expenditure on research and development in SR.

	2001	2002	2003	2004	2005
Expenditure on R&D in mil. EUR	149.3	148.3	169.1	174	194.4
% of GDP	0.63	0.57	0.58	0.51	0.51

Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

Table 7. Percentage of expenditure on research and development - GERD and head counts of R&D personnel – RDHC by sectors.

	2001		2002		2003		2004		2005	
Sector	GERD in %	RDHC in %	GERD in %	RDHC in %	GERD in %	RDHC in %	GERD in %	RDHC in %	GERD in %	RDHC in %
Business ent.	67.3	27.21	64.3	25.82	55.2	21.72	49.2	20.89	49.8	21.63
State. gov.	23.7	20.49	26.6	20.93	31.6	21.3	30.5	18.21	29.7	19.07
Private non-profit	0	0	0	0.02	0	0.04	0.2	0.39	0.1	0.1
HE	9	52.3	9.1	53.23	13.2	56.94	20.1	60.51	20.4	59.2

Source: Statistical Office of the SR, Yearbook of Science and Technology 2006

The presented facts are in sharp contrast to the declared priorities of the official policies of the Slovak government, namely in the context of social development in the Slovak Republic and its international agreements and declarations within the European Community related to the vision of becoming the most developed knowledge-based society with sustainable development. The current situation requires quick and decisive steps and binding measures leading to the improvement of the image and prestige of science, and knowledge in general, in society. The Slovak government and its executive bodies responsible for the sector of science and education are obliged to adopt these measures with respect to their responsibility for the development of Slovak society in the long term perspective.

Bibliography

Babiaková, G., Krivý, V., Majerčáková, S., Matúšová, S, Pekárová, P., Piscová, M., Porubänová, S., Sedová, T. (ed), Vašečka, I.: Women and Science in SAV. Veda, vydavateľstvo Slovenskej akadémie vied, Bratislava 2003, ISBN 80-224-0769-0.

Bútorová, Z.: Fragile beauty. Bratislava: Inštitút pre verejné otázky, 2002.

Bútorová, Z., Cviková, J., Farkašová, E., Gyarfásyová, O.: Equal opportunities for women and men. In: G. Mesežnikov (ed.), Report on the state of society in Slovak Republic in 2002, Bratislava: SME 2002.

Cviková, J., Juráňová, J.: Voices of women. Aspects of women's politics. Bratislava: Aspekt 2001.

EUROBAROMETER – CC-EB 2003.3 on Science and Technology, January 2003, http://europa.eu.int/comm/public opinion/

Farkašová, E., Kiczková, Z., Szapuová, M.: Gender stratification of society. In: Pekarovičová, J., Vojtech, M. (ed.) Slovacicum. Súčasné Slovensko. Stimul, Bratislava 2006, p. 159-173.

Farkašová, E., Kiczková, Z., Szapuová, M.: Gender segregated look at humen/society. In: Teodor Kollárik a kol.: Sociálna psychológia. Univerzita Komenského v Bratislave, 2004., p. 217-230.

Farkašová, E., Kiczková, Z., Szapuová, M.: Die Lage Frau in der heutigen slowakischen Gesellschaft. In: Marija Wakounig (Hg.): Die gläserne Decke.Frauen in Ost-, Ostmittel- und Südosteuropa im 20. Jahrhundert. Verein für Geschichte und Sozialkunde Studien Verlag, Innsbruck, Wien, München, Bozen 2003., p. 113-134.

Farkašová, E., Kiczková, Z., Szapuová, M.: Research on participation of women – teachers and researchers at the Faculty of Philosophy UK. In: Naša univerzita, Spravodaj UK, Apríl 2003, no. 8.

Farkašová, E., Szapuová, M.: Feminism and science - questions, problems, perspectives. Aspekt 1/2003-2004, p. 178-189.

Krivý, V.:Research on gender opportunities in SAV. In: Newsletters of the Slovak Academy of Sciences, 9 / 2002, p. 8-9.

Krivý,V.: Survey on gender púúprtunities in SAV. In: Women and Science at SAS, Ed. Sedová,T., *VEDA, Bratislava 2003*

Kvapilová, E., Porubänová, S.: Uneven ways to equality. Bratislava: Aspekt 2002.

Piscová, M.: Women in science: Making change happen. In: Newsletters of the Slovak Academy of Sciences, 2000 / 9, p. 8-9.

Piscová, M.: Women and science: a review of the situation in Slovakia. In: European Commission (2002). National policies on women and science in Europe, 89-90. OPOCE, Luxembourg, pp. 140, ISBN: 92-894-3579-8.

Piscová, M.: Gender in science – Women in science in Slovakia. In: Sociológia – Slovak Sociological Review 2003, 35 / 6, p. 579-598.

Piscová M., Velichová D.: Wasted talents. In: Newsletters of the Slovak Academy of Sciences, 4/2004, vol. 40, VEDA Vydavateľstvo SAV, Bratislava 2004, ISSN 0139-6307, p. 3-5.

Porubänová, S.: Dialogues women in science: a report for SAV. In: Newsletters of the Slovak Academy of Sciences, 9/2002, p. 8.

Sedová, T.: Women in science: Gender mainstreaming and mapping the equal opportunities in SAV. In: Newsletters of the Slovak Academy of Sciences, 9/2002, p. 7.

Preprint of the Statictical yearbook of educational system in SR 2001, Institute for information and prognosis of the educational system, Bratislava 2002.

Silvera,R.: Handbook of good experience in the gender equality issues in Slovakia, MPSVaR, Bratislava 2006.

Slovakia on the way to gender equality, Ed. Piscová, M., ERPA – SÚ SAV, Bratislava 2006

Szapuová, M.: Does Gender Matter? Some Reflections on the Role of Gender in Science. In: Women Scholars and Institutions. Proceedings of the international conference (Prague, June 8-11, 2003). Studies in the history of science and humanities, Volume 13, Prague 2004, p. 749-764.

Szapuová, M.: Notes to problem of androcentrism of science or why is science a masculinum matter. In: Ženy vo vede - alebo deravé potrubie? Zostavila M. Piscová. Sociologický ústav SAV, Bratislava 2004., p. 45- 54.

Szapuová, M.: Women, science and feminism: to some problems of scientific knowledge from the perspective of feministic epistemology. In: Linková, M., Červinková, A. (eds.): Myšlení hranic. Genderové pohledy na racionalitu, objektivitu a vědoucí subjekt. Sociologický ústav AV ČR, 2005, Praha, p. 39-57.

Szapuová, M.: On leaky pipeline. Knihy a spoločnosť, druhý ročník, 2005, No. 4. p. 7.

Structure of the employees salaries in SR 1998, ŠÚ SR Bratislava 1999.

Structure of the employees salaries in SR 2000, ŠÚ SR Bratislava 2001.

Structure of the employees salaries in SR 2005, ŠÚ SR Bratislava 2006.

Vašečka, I.: Position of women scientists in SAV. In: Newsletters of the Slovak Academy of Sciences, 9 / 2002, p. 7-8.

Večerník,J.: *Inequalities in salaries, income and property of households.* In: Report on the development of the Czech society 1989-1998. Ed. Večerník, J., Praha, ACADEMIA, 1998

Velichová D.: Gender and Science from Communism to Present Day in SK: An Overview, National contribution for ENWISE report, Brussels, EC, 2003, 50 p.

Velichová D.: Wasted talents, Spektrum, No. 4, December, Volume XI/XLIII, Periodicals of Slovak University of Technology, Bratislava 2004, ISSN 1336-2593, p. 6–9.

Velichová D.: Waste of talents: turning private struggles into a public issue. In: Ženy vo vede alebo deravé potrubie?, Sociologický ústav SAV, Bratislava 2004, ISBN 80-85544-36-9, p. 19 – 32.

Velichová D.: Waste of talents: turning private struggles into a public issue, In: Newsletters 12 (2005), European Women in Mathematics Scientific Society, p. 4–13.

Velichová D.: How far is the target?, Implementing Enwise results, Follow-up workshop, Tallinn 2005, Estonia, http://www.archimedes.ee/enwise/follow_up/index.html.

Visegrad States (Czech Republic, Hungary, Poland, Slovakia) (2002). Participation of women in the fields of meteorology, operational hydrology and related sciences. Conference Proceedings, Bratislava: Slovak Hydrometeorological Institute.

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Magdaléna Piscová studied sociology at the Faculty of Philosophy, Comenius University in Bratislava. After finishing her studies in 1972 she started working at the former Czechoslovak Labour Research Institute, where she dealt with issues of work satisfaction and work management organisation. Since 1979 she has been working in the Slovak Academy of Sciences, where she currently holds the post of Director of the Institute for Sociology. Her long-term academic interests focus on the subjects of family, demographic behaviour and gender issues. Since 1999 she is the national delegate in the Helsinki group for women in science by DG Research. She is also a member of several expert EC networks in the field of gender equality, women employment and social inclusion. Besides numerous papers and conference presentations, she has published and edited several books, for instance 'Family life in Slovakia' (1995), 'Women in Science - or leaky pipeline?' (2004), 'Slovakia on the Road to Gender Equality' (2006).

Mariana Szapuová studied philosophy at the Faculty of Philosophy, Comenius University in Bratislava. Since receiving a postgraduate diploma in 1987 she has been working there as Assistant Professor at the Department of Philosophy and History of Philosophy. She runs courses on epistemology and feminist philosophy and lectures on gender studies and feminist epistemology. She is the author of several papers and articles published in scientific journals in Slovakia and abroad. Her professional interests lie in feminist philosophy, especially the topics of epistemology and ethics, and the methodology of feminist research. She has participated in several philosophical and feminist conferences, workshops and seminars. She is a member of the Slovak Philosophy Association and cooperates with various women's NGOs in Slovakia, as well as several institutes dealing with gender issues in Austria, Slovenia and Hungary. She is a co-founder and the programme coordinator of the Gender Studies Centre at the Faculty of Philosophy, Comenius University. She is the president of the Club of Feminist Philosophers.

Daniela Velichová graduated in Mathematics from the Faculty of Natural Sciences at the Comenius University in Bratislava, where she received a PhD degree in Geometry and Topology. Currently she is Associate Professor of Mathematics at the Slovak University of Technology in Bratislava. Besides teaching at university, tutoring PhD students in geometry and geometric modelling, and working in several commissions for doctoral and post-doctoral studies, she is active in the field of mathematical education of engineers as member of the Steering Committee of the Mathematics Working Group within the European organisation on engineering education SEFI, and in the EWM society of European Women in Mathematics. She has published over 150 books, book contributions and scientific papers in journals and proceedings of conferences on mathematics, geometric modelling and computer graphics. Her special expertise is differential geometry of curves and surfaces, geometric modelling and e-learning, and the development of web-based courses in Mathematics. She has participated in several EU projects within different EU research programmes (Socrates Minerva, Leonardo6, FP6). Recently she has been involved in gender issues with respect to the participation and career prospects of women in technical and natural sciences in Slovakia.

Annexes

WOMEN IN LEADING AND MANAGEMENT POSITIONS AT SAS

Elena Gramatová

Since 2000, the research and management work of women scientists and researchers at the Slovak Academy of Sciences – SAS - has been examined intensively. Although there are still only a few women in leading and management positions at SAS, or few women who are achieving higher academic or pedagogical degrees, the situation is improving year on year thanks to the increased interest of the SAS leadership. The Presidium of SAS established a new commission – SAS Commission for Equal Opportunities (EQUAL) - in 2005 in order to support the activities of women–scientists at SAS and to increase their participation in the top positions at SAS or leading positions in SAS organisations. The Commission currently has 9 members, 3 of whom are men. From the very beginning of its origin this commission has proposed a programme, which was turned successively into real tasks. In 2005, the EQUAL commission analysed issues of gender equality and equal opportunities generally, approach strategies in the European Union, in Slovakia and at SAS, and has developed its own programme divided into four levels:

- inside SAS (various statistics on the participation of women in leading and management positions at SAS, in projects, in PhD studies, their awards, etc., obtained since 2000; also, projects providing help to young families have been realised);
- at the national level (contact with the Ministry of Education of the Slovak Republic, existing societies and institutions in Slovakia, which are actively involved in the equal opportunities issues, participation at events organised in Slovakia and focused on this issue);
- at the international level (active participation at events organised by the EC, following programmes and events focused on gender equality and equality in opportunities in Europe);
- dissemination level (to increase the presence of women scientists and both young female and male scientists and researchers from SAS in the media, to prepare and publish a booklet on the position and activities of women scientists at SAS, introducing statistical data from 2000, etc.).

The Commission's first subject of interest was the young generation at SAS, and its professional progression. It is pleasing that the total number of women in PhD studies is higher compared to men (statistics from 2000 and 2005 in Fig. 1), although in technical specialisations the participation of women is lower (the graph in Fig. 2 shows statistical data for different specialisations in 2006). Despite the fact that representation of women in PhD studies is higher, this is not, unfortunately, reflected in the subsequent qualification progress, or in the achievement of academic or pedagogical titles in the following years. In Fig. 3, statistical data from 2006 are presented, where one can see that although in 2000 there was a higher percentage of women present in the doctoral studies at SAS, this was not reflected in the number of workers with the PhD title, or with a higher or pedagogical degree in 2006. In this figure, the most current statistics of SAS workers with higher rank or higher academic degree are presented, showing that the participation of men is considerably higher. It is obvious that during the period of her doctoral studies or closely after graduation a woman also has maternity or parental duties, and therefore she is likely to give up her further scientific ambitions. This is the reason why the EQUAL commission at SAS decided to support young mothers or young families more actively, enabling young mothers to come to their workplace with their child and organise consultations with the tutor or arrange a short-time stay in the laboratories even during their maternity leave.

Fig.1: Participation of women in PhD study programmes.

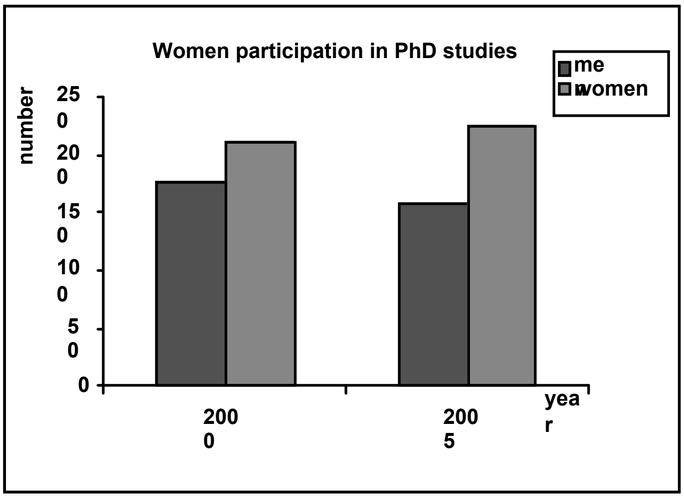
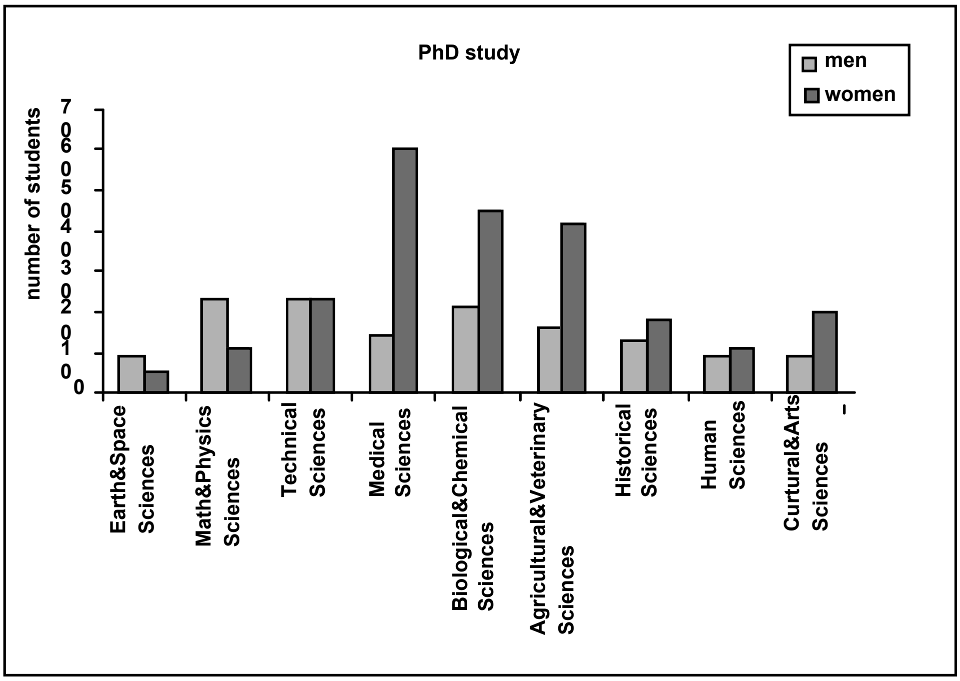
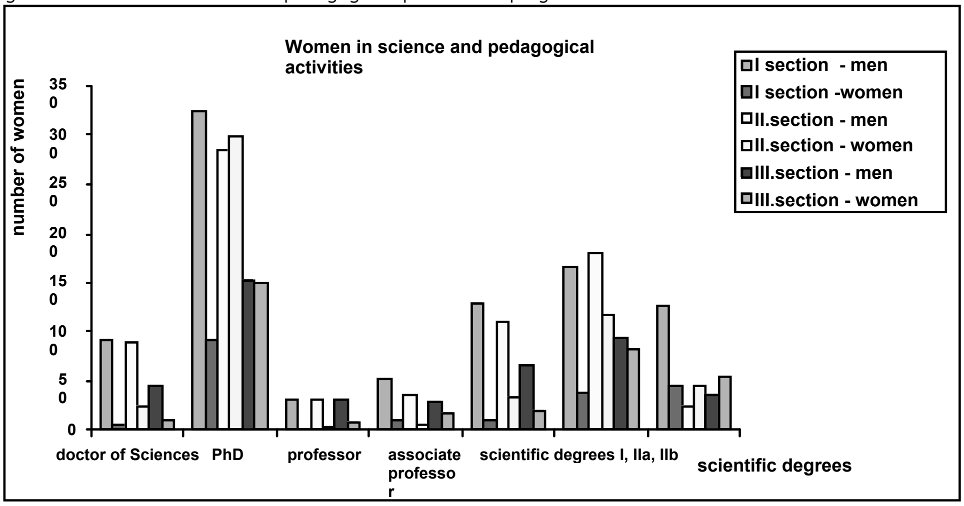


Fig. 2: PhD study programmes by specialisation, year 2006.



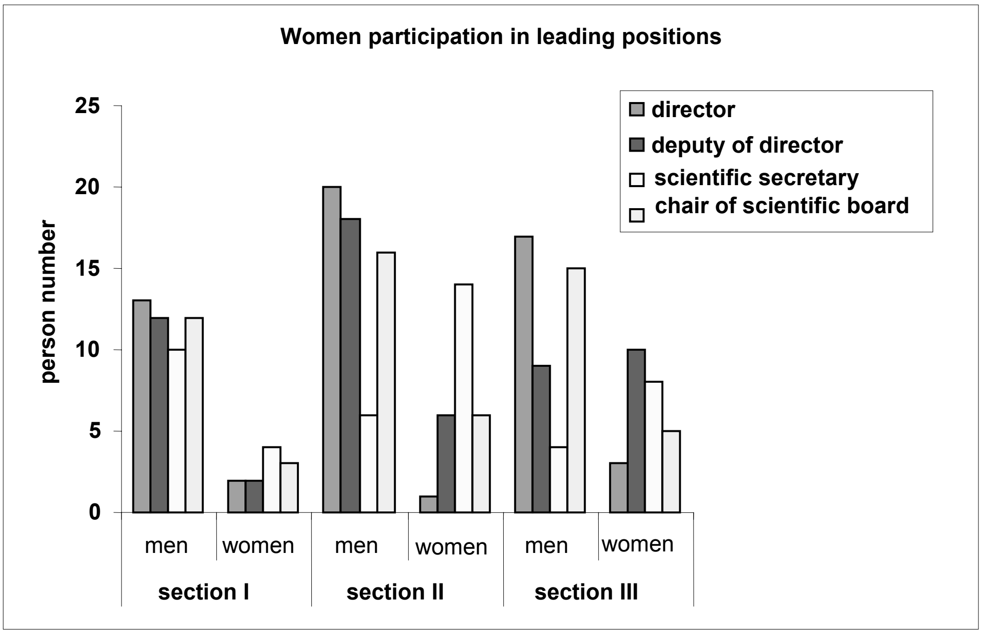
A special programme for active help to young families and parents on parental leave or unpaid leave due to caring for small children has been elaborated into a project to develop a children's corner in the area of SAV at Patrónka (part of Bratislava city), where a large number of SAS organisations is situated. The children's corner (similar to the children's areas located at large supermarkets) will serve as a short term child-care provision facility under the supervision of qualified professionals. Young people from SAS welcomed this proposal very positively and supported the realisation of the project in a relatively rich discussion on the SAS web page. The children's corner at SAS was opened as a contribution to young scientists, both women and men, in 2007, the year which was declared year of equality in opportunities by the European Commission.

Fig. 3: Statistics of scientific and pedagogical qualification progress from 2006.



Women scientific workers at SAS have also more active in taking leading positions as directors, deputy directors, and secretaries in their organisations, or positions of presidents of scientific boards at SAS. Current statistics related to this are presented in Fig. 4 (Section I. comprises Natural Sciences about Inorganic Nature; Section II. sciences about Living Nature and Chemical Sciences, and Section III. about Society and Culture contains Humanities and Social Sciences).

Fig. 4: Statistics on the presence of women in leading positions in their organisations from 2006.



Computer and management skills courses, English language and standards in laboratories courses have been organised at SAS since 2006, within the franmework of the ESF project of life-long learning for SAS workers. It is pleasant that women participants are currently dominant in these courses. The role of women in leading and management activities is very important and it is necessary to increase their participation in this area. Statistics on the presence of women in the top bodies of SAS and in the leading positions in SAS organisations will be further intensively observed and women will be supported in their effort to be promoted to these posts.

THE GENDER STUDIES CENTRE AT THE FACULTY OF PHILOSOPHY, COMENIUS UNIVERSITY IN BRATISLAVA
Mariana Szapuová

The Gender Studies Centre is a university-based educational and research institution at the Faculty of Philosophy, Comenius University, Bratislava. Founded in 2001 as the first Slovak institution of its kind, it focuses on research and teaching activities in the field of gender studies and feminist theory. The Centre creatively continues the ten years' tradition of similarly oriented educational and research activities advanced at the Department of Philosophy and History of Philosophy at the Faculty of Philosophy. The foundation of the Centre aims to bring the level of education to the standards of the countries where Gender Studies form a legitimate part of education in the field of social sciences and humanities as an expression of democratic policy in education.

Gender Studies as an interdisciplinary field of study focuses on issues concerning the social organisation of the relationship between women and men in various spheres of life and on their theoretical reflection. The main subjects of interest of the Centre, regarding both its educational and research activities, are issues of gender identity, gender-specific differences and symbols which structure gender relations in society, as well as issues concerning women and science.

In the field of educational activities, the Centre runs courses on gender studies and feminist philosophy designed for students at the Philosophical Faculty, thus providing important new knowledge on gender issues and supporting gender sensitivity. These courses are also aimed at cultivating critical thinking and the ability to argue from the gender point of view. Gender Studies courses carried out by the Centre not only bring new knowledge on gender issues to students, but they also contribute to their ability to deconstruct gender stereotypes.

Besides courses on Gender Studies designed for the whole student body of the faculty, teachers affiliated to the Centre also give courses on feminist philosophy, feminist epistemology and feminist ethics.

In addition, the objectives of the Centre are to promote scientific research activities thematically focused on gender issues. Starting with the methodological approaches created in feminist theories, the research aims to integrate the gender perspective into social sciences and enrich them by including new issues, approaches and results, opening up the space for interdisciplinary discussions on gender issues from a historical perspective and the perspective of women and men in contemporary society.

Research activities provided by the Centre focusing on gender issues are based on the methodological approaches elaborated by contemporary feminist theories.

Some the Centre's recent and contemporary research projects have been developed with the support of the Slovak Scientific Grant Agency (VEGA), for example a project on the construction of gender and gender differences from the viewpoint of feminist philosophy and the development and current perspectives of feminist philosophy in the context of contemporary philosophy, as well as other projects.

A research team consisting of members of the Centre and several well known sociologists recently concluded the project Study on equal opportunities of women and men in science and research as a specific area of the labour market, which was conducted at several higher education institutions in Slovakia. The main focus of this research were topics concerning equal opportunities in the field of academic science, career path of women and men, horizontal and vertical segregation and the mechanisms of their reproduction.

Members of the Centre were involved in several international projects, such as the Women's Memory project, build on the basis of oral history and oriented toward examining the life strategies of women under socialism . Another international project supported by the EU Program Socrates focused on the Promotion of Women in European Regions (POWER).

Currently, the Centre is undertaking a project within the framework of EQUAL entitled Elaboration of a conception of education towards equal opportunities on the basis of Gender Mainstreaming, supported by ESF, which aims to elaborate an innovative conception of education towards equal opportunities of women and men as a precondition for eliminating current inequalities on the labour market. As a starting point for the development of the conception of education, research is conducted on gender stereotypes existing within the institutions of higher education, as well as in practice. The elaborated conception of education is to be tested through several pilot courses taught at universities and through gender training for employees and unemployed people. An important part of the project is the organisation of a 'Gender Studies Summer School.'

Members of the Centre are currently involved also in the international research project Knowledge, Institutions and Gender: an East-West Comparative Study (KNOWING): a specifically targeted research project funded by the European Commission in the Structuring the ERA specific programme of the 6th Framework Programme.

It is a three year long international research project focused on issues relating to institutions and processes of knowledge production. The research interest is concentrated on gender dimensions in science, scientific institutions and scientific practices with the aim of examining the production of knowledge contexts and cultures, including the role of gender, from an 'East-West' perspective and to identify structural and institutionalised practices and procedures, including standards of excellence, that hinder and/or promote equal participation of women in science. This research will culminate in a comparative cross-national analysis. A summary report will give an account of national practices and the role of gender in knowledge contexts, identify potential differences due to historical divergences in Eastern and Western Europe, and make recommendations for the promotion of gender equality and the engagement of young people in science.

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Endnotes

1 Farkašová, E.: Na ceste k 'vlastnej izbe'. Postavy/podoby/problémy feministickej filozofie. IRIS, Bratislava 2006.

2 Kiczková Zuzana (editor): Womens Memory. The Experience of Self-shaping in Biographical Interviews. IRIS, Bratislava 2006.

3 Jakowitsch, J., Szapuová, M., Molnár, A.: POWER. Promotion of Women in European Regions. Austria – Hungary – Slovakia. Final Report, Grundtwig 2 within the Socrates Programme of the EU. Research Society Burgenland, 2006.

WOMEN IN SCIENCE – SLOVENIA: TO BE OR NOT TO BE A WOMAN IN SCIENCE

Dunja Mladenic

Introduction

Dunja Mladenić

This document is based on the Enwise National Report for Slovenia on Women and Science (Mladenić, 2003) extended in several directions including an appendix. It is structured into three parts giving a brief description of situation of women in science as follows. 'Pre-socialist era in Slovenia' describes the period from the end of the 19th century until World War II giving statistics on employment and women at university. 'Socialist era in Slovenia' (1945-1990) outlines considerable changes in society emphasizing equality, popularisation of education and the introduction of women studies at universities. 'Transitional period and EU membership' outlines several aspects of equality in society, some statistics on women at university and describes several aspects of scientific careers. Appendix contains several contributions by different authors. One contribution outlines the main issues concerning women in science and research in Slovenia as identified by the *Office of the Government of the Republic of Slovenia for Equal Opportunities* during an open discussion in early 2006 (at the time, Slovenia was in the first two years of its EU membership). On the initiative of the Commission for the Promotion of Women in Science, the Science Office at the Ministry of Education, Science and Sport collected data on gross incomes of the employees in public research institutions according to gender, education and research title for 2001, 2002 and 2003. The main findings are outlined in one of the contributions in the Appendix. Women in science has been a topic of sociology and philosophy research for some time; one of the contributions in the Appendix shows it in the light of inherited differences in the treatment of men and women.

Before starting to describe the situation of women in science in Slovenia, let me add a personal note on the experience of being women in science. Starting my research career in computer science in the late 1980s at the main national research institute during the socialist period and continuing through the transitional period was a nice opportunity to be at the centre of scientific endeavours and changes in the field. The high quality of the group I was associated with at the Jozef Stefan Institute in Ljubljana, Slovenia, and its international recognition was an advantage for setting high goals and getting good examples of high quality, enthusiastic research work. It was also evident that all the women scientists involved were extremely dedicated to their research, struggling to achieve an appropriate work-life balance. At the same time, observing the situations of some colleagues in other fields and the behaviour of senior researchers towards the younger generation was sometimes rather unpleasant, putting the whole concept of scientific inquiry in question. As young people can be idealists, it is not unusual to have an expectation of scientists to be searching for truth no matter what, while the reality is in most cases rather different. Unfortunately, many young researchers have almost no choice but to include a number of co-authors from the hierarchy above them in their work, even though some of the co-authors might not have contributed to it. One of important issues in my case turned out to be a very supportive (female) advisor, co-workers and colleagues open to scientific discussion and of course family and friends, as all these can greatly enhance the self-confidence of a young researcher. An important step in my personal scientific career was getting funding for two long stays at one of the top universities in the field (Carnegie Mellon University, USA), during the first visit working for over a year on my PhD thesis and during the second spending over a year as a post-doc. Another important step was securing several national and international projects, including the co-coordination of a large European RTD project. It is hard to say how many of the difficulties encountered in the local environment during these important steps were due to gender issues and how many due to youth issues. It is clear that being a young woman scientist is not a trivial matter and a lot of energy has to be expended on creating good working conditions. For instance, writing a project proposal, being awarded a project and taking care of the work is sometimes not sufficient to ensure control over deciding on the use of the associated funding. The good part is that not only young researchers of both genders, but also some senior researchers recognise changes and are prepared for them. Having clear recommendations and support from the EU can be very helpful.

Pre-socialist Era in Slovenia

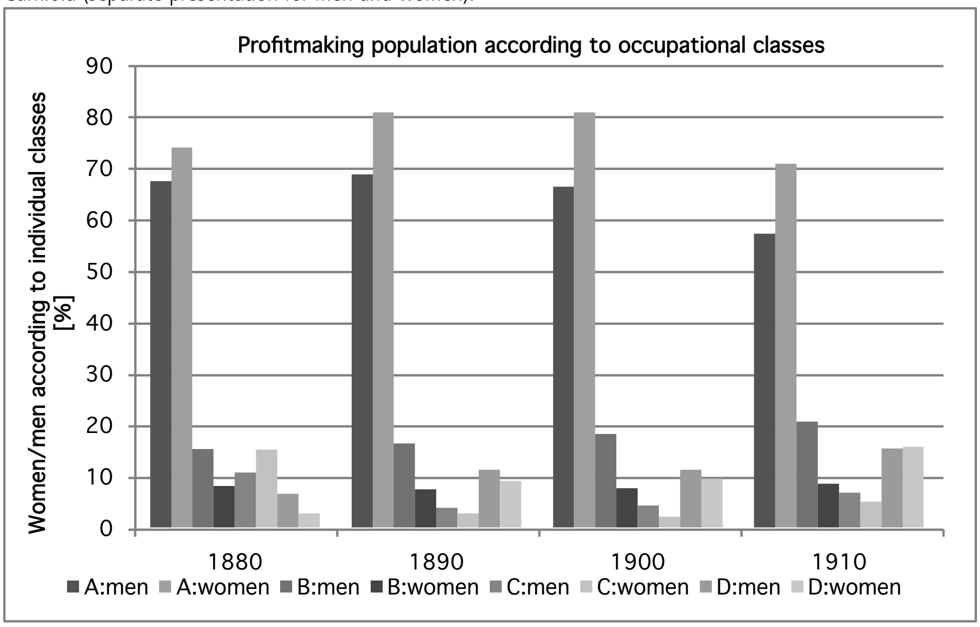
Dunja Mladenić

Within the territory of today's Slovenia, the period between the middle of the 18th century and the middle of the 19th century was marked by the agrarian revolution, the prevalence of manual production and the beginnings of industrialisation. During the second half of the 19th century manual production, small trades and agriculture started to lose their battle against intense industrialisation. An increasingly large section of the rural population found employment in towns and emigrated to Western Europe and North America (Fischer, 1986). Within Slovenian territory the leading role in development was taken over by the mining, metallurgy and timber industries. All of them depended on the use of the country's natural resources. The process of industrialisation was marked by insufficient technical knowledge of workmen. Only a small share of workers was highly qualified (they were exclusively men) and most of them had been part born outside the Slovenian ethnic territory. Between the period of industrialisation and World War I, the basic economic infrastructure was established as well as the system of Slovenian financial institutions. The literacy of the population within Slovenian territory was very high; it exceeded 90 % (Lazarević, 2001).

EQUALITY IN SOCIETY

During the second half of the 19th century and until World War I, most of Slovenian territory was part of the Austrian half of the Habsburg Monarchy and it was known as Carniola. In the archives of the Austrian National Statistics Office we can find data regarding the population (Žnidaršič, 2000), including the professions (census surveys in 1880, 1890, 1900, 1910). According to social affiliation, the population was divided into employed (freelancers, workers, those providing assistance at home) and unemployed population (supported family members, household servants) and according to occupational affiliation into occupational classes (A: land and forest economy; B: industry and trade; C: commerce and transport; D: public and military services, freelancers, no occupation stated). In comparison to other Austrian provinces, Carniola had a large share of women among the employed population. Between 1880 and 1910 the share of women among the employed population was on average 49.4 % (in the whole population of Carniola the share of women was 53.2 %). Most employed women in Carniola belonged to the category of those providing assistance at home (in 1910, 56.1 % of all employed women had this status while the Austrian average was 43.4 %). Only 11.9 % of women had the status of a worker (the Austrian average was 20.5 %). The majority of the population in Carniola was employed in agriculture (occupational class A). As time passed, the share of the employed population in industry grew, particularly among men (from 15.3 % in 1880 it increased to 20.6 % in 1910, Figure 1).

Figure 1. Distribution of the employed population according to occupational classes from 1880 until 1910 in Carniola (separate presentation for men and women).



WOMEN AT UNIVERSITY

In Slovenia the difficult economic situation between the two world wars has forced many women to find employment and contribute to their family budget. They were mainly working in factories, storehouses, shops and as servants in better situated families. This situation also raised some debates in society about how appropriate it was for married women to be employed instead of staying at home and devoting all their time to taking care of home and family. So, women ended up staying at home and in the family environement, usually with a large number of children, living on a single income. Not very attractive for young people, evident also in a higher number of single people (also caused by legally determined economic marriage conditions), as the salaries of many men were too low to support a family without the wife being employed. One of the consequences was an increasing number of women in high schools and universities. For instance, in 1929 there were 31.5 % of women in high schools and 27.6 % at the Faculty of Arts (out of about 450 students), while in 1939 the percentage of women increased to 49.5 % in high schools and 47.5 % at the Faculty of Arts (Jogan, 2001).

However, women were officially not present in science of Europe until the late 19th century. In the Austro-Hungarian Empire (which Slovenia was part of at that time) universities were opened to women in 1897. The first university established in Slovenia was the University of Ljubljana, established in 1919 on the foundations of a long pedagogical tradition. For almost half a century it remained the only Slovenian university until it was joined by the University of Maribor in 1975. No other universities were established in Slovenia until the early 21st century; the University of Primorska in 2003 and the University of Nova Gorica in 2006. In the context of women in science, it is worth pointing out that the first PhD of Ljubljana University was given to a woman. Namely, University of Ljubljana, established in 1919 assigned its first PhD on 15 July 1920 to Anka Mayer (a woman) for her PhD thesis in chemistry on 'Influence of formalin on starch.'

EDUCATION OF WOMEN IN SLOVENIA BEFORE WORLD WAR II

Dalija Sega, Faculty of Arts, University of Ljubljana, Slovenia

Education of women in the 19th century

In Slovenia the 'woman question' emerged in the 1870s as a result of outside influence. It was first dealt with by men-politicians. Emancipation meant liberation from all weaknesses, deficiencies, such as lack of learning, insufficient general knowledge, only to the extent however, that was useful to the nation. In the 19th century education was not favourable to women – at least as far as education at grammar schools and university faculties was concerned. With support from their families who saw their daughters' education as progress for the family and for the nation, a few rare female individuals were able to study at faculties. Consequently, most educated women came from families that were aware of the importance of women's education and at the same time had enough financial resources to enable their daughters to study in Vienna or Prague.

First women teachers and professors

In 1901 the first Slovenian feminist society was established in Ljubljana. Its main objectives included education of women, as well as cultural, social, pedagogical and other work for the benefit of women and society in general. At that time, the education system restricted women's rights to education at secondary schools and faculties. The only secondary school intended for girls was the girls' lyceum which, however, did not enable the girls to continue their education at faculties. Secondary schools and grammar schools were institutions intended for men. Women's colleges of education were established where women were trained to become teachers. At that time, teaching was practically the only intellectual occupation accessible to women. With the establishment of public women's colleges of education in 1870, women were provided with an educational institution which enabled them to obtain an education outside the sphere of trade. They were the only public schools which provided girls with higher education and the chance of employment that brought independence and income. The first Slovenian women professors did not complete their education until in 1897 when Slovenia received permission from Austria allowing women to study at the Faculty of Arts.

The first academically educated Slovenian

The first academically educated Slovenian and the first woman professor was Marija Wirgler. She was born in Novo mesto and in 1905 she graduated from the Faculty of Arts in Graz. Later she started teaching at the girls' grammar school – she loved teaching and at the same time the school needed good teachers so she was able to work until 1934. Besides teaching, she was also actively involved in other areas. She was the librarian and secretary of the White-blue Library. This was a women's publishing house with the aim of publishing one book by a Slovenian female writer or poet each year, as well as translations of foreign female writers. Marija Wigler is known above all as the author of books for youth. Her works mostly describe the animal world which she knew well because her father was a veterinary surgeon. In her stories she stressed the importance of love for nature.

The first woman doctors and lawyers

In towns, the movement for the right to study at universities was gaining in strength towards the end of the 19th century. Only from the end of the 19th century onwards, were girls able to take the final secondary-school examinations under similar conditions as boys. The first Slovenian woman candidates passed the final secondary-school examinations at the first state grammar school in Graz, at grammar schools in Klagenfurt, Ljubljana and Koper. Some girls decided to continue their studies; at Austrian universities, however, girls were at first only allowed to study at the Faculty of Arts. The next two faculties which opened their doors to girls were the Faculty of Pharmacy and the Faculty of Medicine. By 1919, twelve Slovenian students had finished their BSc degree.

At the Faculty of Medicine in Ljubljana, which had a two-year study programme so that the students had to finish their studies in Zagreb, 51 women had finished their BSc degree before World War II. In 1945, 68 women and 766 men were members of the Medical Chamber. The University of Ljubljana was founded in 1919. Women were able to study law only after the Faculty of Law was established in Ljubljana, also in 1919. In 1919/1920 the Faculty of Law had 3 female and 224 male students, in 1924/1925 it had 9 female and 374 male students and in 1929/1930 29 female and 341 male students. Up until 1926, only 3 women had completed their studies at this faculty, and by the end of 1935 four women had received a PhD degree. However, it was a long time before women were able to practice the basic legal professions. They could not be lawyers, and at courts they were able to work only as trainees and secretaries, i.e. they could only work as judicial assistants. A woman had the opportunity to finish her studies at the faculty of law, become a PhD in law and pass her judicial or lawyer's examination, however, in the judiciary this did not suffice for a higher working position. Women could become lawyers from 1929 onwards and already in the same year the first woman became a member of the Bar Council. This was Zora Tominškova. Until the beginning of war, two more women were registered in the Bar. The position of a judge was available to women only after World War II.

Endnotes

1 Summarised according to: General Women's Society 1901–1945. Ljubljana: Archives of the Republic of Slovenia, 2003.

Socialist Era in Slovenia

Dunja Mladenić

The socialist political system was introduced in Slovenia after World War II, when Slovenia was part of the Federative Republic of Yugoslavia (from 1974 the Socialist Federative Republic of Yugoslavia). The process of industrialisation was intensified and was characterised by centralised/planned development and the introduction of state ownership.

During World War II the majority of people in Slovenia supported the national liberation war against various occupying forces led by the partisan army. Men and women were equally involved in these endeavours. It is true that the role of women was in many cases supportive, such as nursing, but many women also participated as active members of the partisan army. During World War II in 1942, women in Yugoslavia were granted equal voting rights. This provided grounds for women's rights after World War II, when an important step in political life was that Yugoslavia's first Constitution guaranteed equal voting rights to men and women.

EQUALITY IN SOCIETY

Despite the voting rights, the participation of women in political life until the end of 1960s was lower than it should be. Namely, the issues related to the position of women were not seriously considered, as there were many other questions especially regarding the economic situation and positioning of different classes that were at the centre of political debates. The main political players were also convinced that women issues had practically been solved by the constitutionally guaranteed equality of women that was already in place in 1946 in the first socialist Constitution of the Federative Republic of Yugoslavia (and also in the Constitution of Slovenia). Important changes came later when we can observe the increasing role of women in society, as well as the shaping of social welfare institutions, especially in 1970s and 1980s, when many day-care institutions for small children, elderly homes, health centres and other facilities were opened. The proportion of all pre-school children in day-care institutions consequently grew from 33 % in 1979 to 52 % in 1987 and 57.7 % in 1997 (Jogan, 2001). The weakening of the importance of the Catholic Church that had a long tradition of associating women mainly with their family roles, also contributed to the increasing role of women. In 1974, by the provision in the Constitution of the Social Federal Republic of Yugoslavia, women got the right to freely decide on giving birth. At the same time, maternity leave was extended from 135 days to 6 months (from 84 days in late 1940s to 105 in 1950s, 135 in 1960s) and two years later in 1976 the legal possibility of the division of maternity leave between the parents was introduced. In 1986 maternity leave was prolonged to 1 year including full compensation of income. Despite the possibility of dividing a larger part of maternity leave (parental leave), in 1990s only 1 % - 2 % of fathers shared the parental leave with their spouse. The one-year parental leave was split into 105 days of maternity leave (to be taken exclusively by mother, starting 44 or 28 days before the delivery date) and the remaining parental leave (to be freely split between the parents - either sequentially or with both parents working part time). Starting with 2003, fathers in Slovenia got the right to take an additional 15 days fatherhood leave (to be used during the first 105 days of maternity leave) on top of the already established 1 year parental leave. In addition, fathers can use up to 90 days in total with partial coverage of income as fatherhood leave.

WOMEN AT UNIVERSITY

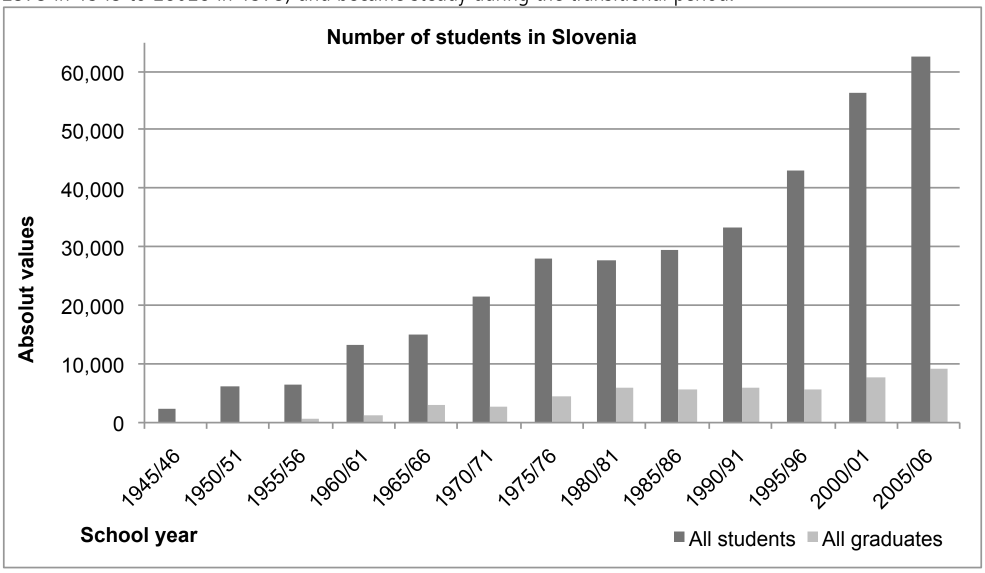
After World War II, the number of students and the percentage of women in higher education increased further, as shown in Table 1, Figure 2, Figure 3, Figure 4 and Figure 5 (based on data published in Research results, 1995, and obtained from the Statistical Office of the Republic of Slovenia for 2000/01 and 2005/06).

Table 1 Percentage of women students at different levels of education and an absolute number of all students at those levels over a 60 year period following World War II.

Year	Women students	All students	Women graduates	All graduates	Women MScs	All MScs	Women PhDs	All PhDs
1945/46	31.2 %	2,575	28.9 %	69				
1950/51	32.3 %	6,232	30.6 %	379				
1955/56	30.7 %	6,671	37 %	759				
1960/61	28.9 %	13,492	36 %	1,319				
1965/66	38.3 %	15,082	32.8 %	2,951				
1970/71	42.4 %	21,632	42.1 %	2,663				
1975/76	44.5 %	28,028	46.7 %	4,501	18.2 %	165	17.7 %	79
1980/81	53.9 %	27,707	49.8 %	5,967	19.8 %	176	20 %	65
1985/86	52.8 %	29,601	58.8 %	5,621	19.1 %	178	21.3 %	89
1990/91	55.6 %	33,565	59.6 %	5,951	35.6 %	466	26.4 %	121
1995/96	56.3 %	43,249	59.6 %	5,812	38.7 %	377	36.2 %	160
2000/01	57.3 %	56,298	58.5 %	7,725	50.6 %	3,732		
2005/06	60.1 %	62,690	64.1%	9,197	56.6 %	5,473	46.8 %	1,012

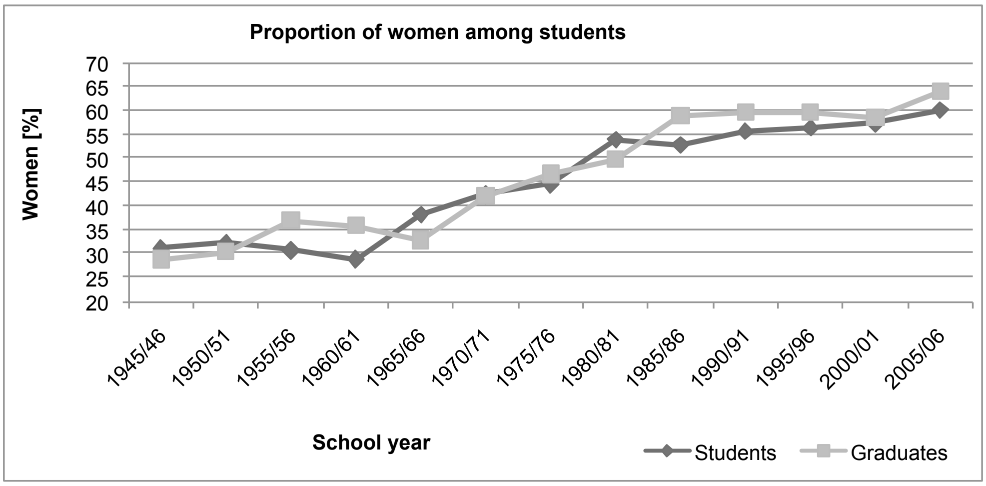
As the new socialist system recognised the importance of education and provided free education from primary school until university graduation, the total number of students in Slovenia grew rapidly from 2,575 in 1945 to 28,028 in 1975, stabilised for 10 years and then doubled by 2005 (see Figure 2). Proportional to the growing number of students, the number of graduates also grew, but the proportion of students graduating remained rather stable, with only every 5th or 6th student successfully finishing his/her studies.

Figure 2. The number of students in Slovenia was growing rapidly during the first 30 years of socialism (from 2575 in 1945 to 28028 in 1975) and became steady during the transitional period.



Not only was university education gaining popularity in general, but it was gaining popularity particularly among women. The proportion of women students increased from 31 % in 1945/46 to 56 % in 1995/96 and 60.1 % in 2005/06 (see Figure 3). Women also became more successful at graduating; while 29 % of graduates in 1945/46 were women (slightly lower than 31 %, the total percentage of women students), in 1995/96 women became more successful than men, constituting 59 % of all the graduates (which is slightly higher than 56 %, the proportion of women students).

Figure 3. Proportion of women studying and graduating at Slovenian Universities, growing from about 30 % in mid 1940s to almost 60 % in mid. 1990s.



WOMEN STUDIES

Gender issues were recognised as important and introduced in education at the end of the 1970s, influenced by initiatives and research studies in other countries. The first initiatives were at the Faculty of Social Studies and came through topics for homework assignments and Bachelor theses, in the form of papers on the position of women in society or the transformation of the family, for example. The next step was to introduce some gender related topics in multidisciplinary postgraduate studies for experts in family and marriage issues. In the 1980s the first specialised courses were introduced into regular postgraduate programme in sociology. In the 1990s the problem of gender differences was also introduced in the regular programme of the High School for Social Workers and in the programme of the Faculty of Arts. The addressed topics were broadened to include various other issues, such as the image of women and the influence of media on gender issues, the sociology of gender differences, and the position of women in science. Additionally, different theoretical approaches and methods were studied and the research results were published at national and international events, in journals and books. In the late 1990s an independent interdisciplinary postgraduate programme was launched at the Faculty for Arts. All this gradually raised the awareness of, and sensitivity for, the issues of gender equality at different levels of education, not only in social studies but also in other humanistic disciplines.

Transitional Period and EU Accession and Membership

Dunja Mladenić

With the declaration of independence of Slovenia in 1991 and the Ten-Day War between civil defence and volunteers and the Yugoslav army, Slovenia attained multiparty parliamentary democracy and the market economy. A number of political, social and economic changes took place, influencing science in different ways. For instance, one of the simple questions that became crucial to being able to continue studying in peace and receving support for postgraduate studies was issue of permanent residency at the time of the change. Namely, many students and young researchers living in Slovenia did not bother changing their place of residency from that of their parents, even though it was suddenly in a different republic of Yugoslavia. Most of the students and young researchers did not own apartments and it was very difficult to find a landlord who was prepared to sign someone for a permanent residency. As it was not clear what the changes would bring and students and researchers are usually too busy, most of them did not recognise the importance of the residency issue until it was too late. Then, the question of possibly having to pay tuition (for what had been a free university education under socialism) or losing (or not getting) the position of a young researcher became the central issue in their life, having negative influence on the success of their study and research. Due to this undefined situation, many official processes were stopped for a while, including the handling of submissions for funding young researchers. This brought many young, perspective students to the edge of survival, having to choose between their passion for research (waiting to get their scholarship submissions considered – which took over a year) and returning to their parent's place (which usually meant giving up on research, as the economic and political situation in other republics of Yugoslavia was deteriorating).

EQUALITY IN SOCIETY

The transitional period resulted in democratisation but also the renewal of patriarchalism. The proportion of women in parliament dropped from 26 % in the 1970s to 20 % in the 1980s, 15% in 1990 and 12% in 2004 (based on data from the Statistical Office of the Republic of Slovenia). At the beginning of the transitional period, this drop in proportion of women in political bodies was justified by the need for adjusting to European values where women should return to their primary role in the family. It was fortunate that the shaping of social welfare institutions under self-governmental socialism contributed to the higher self-confidence of women. This was especially beneficial for defending the rights of women, as was evident from intensive discussions and successful defence in 1991 of the reopened issue of the rights of women to freely decide on giving birth.

Different societies and bodies were established to address women's rights initiated either by individuals, other organisations or the State. In the 1980s the number of women's societies evidently increased, including the women's section at the Slovenian Sociology Society, various organisations offering support to victims of family abuse (accommodation for victims, a telephone helpline for women and children). The society for the Equal Opportunity of Women and Men was established in the1990s, as well as the Association Fighting against Sexual Abuse, society for Promoting Women 's in Culture etc. At the end of the 1990s, there were five different women's groups within the political parties. Even though the number of different groups fighting for women's rights was considerable, the main problem was the low level of cooperation between the groups having different directions and addressing different parts of society. Finally in 2001 a Coalition for Promoting Equal Opportunity of Women and Men in Public Life was established with one of the main goals being changes in the voting system in order to get balance between women and men in all political bodies.

Although laws regulating equal opportunity including equal voting rights for women and men have been in place since socialism, problems appear with putting them into practice. It is hard to get established in science and it is easy to get forgotten if one are not around for a while. For a woman, being on maternity leave for a year means that either there will be someone to help her with getting back and catching up with the new situation and changes in research, or she will have to risk losing her position and maybe have to consider changing to some other aspect of scientific work – of a more political or organisational nature.

The most problems still appear in the private sector, where, even if against the law, a female job candidate often gets questions regarding her private plans on having children or is even asked to sign that this is not going to be the case for the next year or two. In neighbouring Croatia, there are even situations when a woman on maternity leave gets fired, which is of course against the law but the system is processing civil juristic cases so slowly that a 5 years waiting time is not surprising.

Material and moral burden on women has become a regular part of everyday life. If we consider paid and non-paid work, women are largely contributing to the wealth of society, and yet at the same time they are marginalised in terms of their power and influence on society. Women scientists are under particular pressure from society claiming that their devotion to work is harming their families, while the other possibility of redistributing family duties between the partners is usually ignored both by families and society.

Status of scientists and researchers in society

In Slovenia, we are witnessing the transition from industrial to information society. This process puts scientists and researchers in an important position in terms of keeping up with the competition, especially in applied science. Being a small nation (of roughly 2 million) historically surrounded by larger nations additionally places emphasis on a high level of commitment to work and keeping national identity. This helps Slovenian scientists and researchers to get established within the European and international scientific community, compensating for some of the difficulties present at national level. Namely, as most of the research funding comes from the government, the status of scientists and researchers in society depends to a great extent on political trends and the proportion of the budget assigned for science and education.

Employment possibilities for scientists in Slovenia are mainly connected to the universities and research institutes, all predominantly funded by the government. High grades, high level of commitment and professional visibility are the main conditions for getting a position. Graduate study is supported by the government, providing the opportunity for accomplished students to work on their MSc or PhD degree while doing research and building their scientific profile. Usually, in a good scientific environment capable of securing enough research projects, this is sufficient for a dedicated young scientist exhibiting good quality work and successfully finishing a PhD to get a research position on some of the ongoing projects.

The structure of scientific institutions to a large extent remained the same as it was under socialism and during the transitional period. Currently, there are no private research centres and the research units established in some larger industries are actually working on development and not really doing research. The main place for research is still at the universities and public research institutes. The government is trying to stimulate applied research by offering support to research institutes and universities for projects that already have commitment for partial funding from industry. This means that employment for scientists is currently possible almost exclusively under government funding and in the last few years also in new private companies, mostly various spin-offs from the research institutes.

Top positions and women's access to decision-making

There are few women in decision-making positions and this holds true in general and not only in science. The situation is improving slightly but there are still many historical connections and influences that result in men holding the leading positions. It seems that in order to get established in the local environment, and especially to occupy a leading position, a woman has to work harder than her male colleague. In science, almost exclusively a kind of 'male behaviour' is expected from a woman in a leading position.

The proportion of women in leading positions in scientific bodies has increased since the transitional period. For instance, among experts at the Council for Science and Technology in 1993 there were 4 % of women compared to 17.1 % in 2001. At the National scientific research council, 5.9 % of women experts in 1993 increased to 30 % in 2001.

New forms of pay gaps within scientific institutions

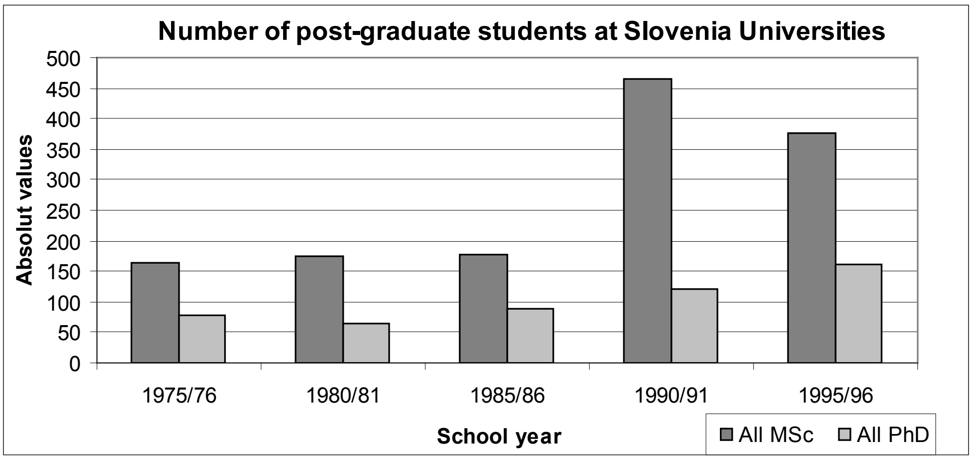
As in many other countries, women are legally equal to men but there is subtle discrimination that can be seen in the underestimation of women's work and achievements, smaller numbers of awards, unequal burdening of women with necessary and unpleasant tasks, stricter control of promotion and more formal measurement of their work output. This is also connected to women being more socially isolated by not being admitted to informal networks, which seems to be important in building a professional career. Additionally, family overburdening contributes to worse conditions for academic promotion as well as lack of self-confidence. One of the known misconceptions that are mostly present among women is that their hard work and achievements will be noticed and awarded by their colleagues. It is true that a good manager and group leader would do so, but it is also true that in scientific institutions most of the higher positioned scientists are good scientists but unfortunately very few of them also have the qualities needed for a good group/project leader.

The analysis of statistical data on gross earning structure in national research institutions for women and men in 2001 - 2003 has revealed that women in Slovenia with secondary, high school and non-university college degrees have about the same gross earnings as men. The difference is present at the level of the university degree, MSc and PhD, where women's gross earnings are about 90 % - 92 % of men's gross earnings. A closer look shows that the main source of differences comes from the leading position supplements where women with a university degree, MSc and PhD, have supplements of only 33.5 %, 26 % and 46.2 % respectively (see Appendix, P. Novak).

WOMEN AT UNIVERSITY

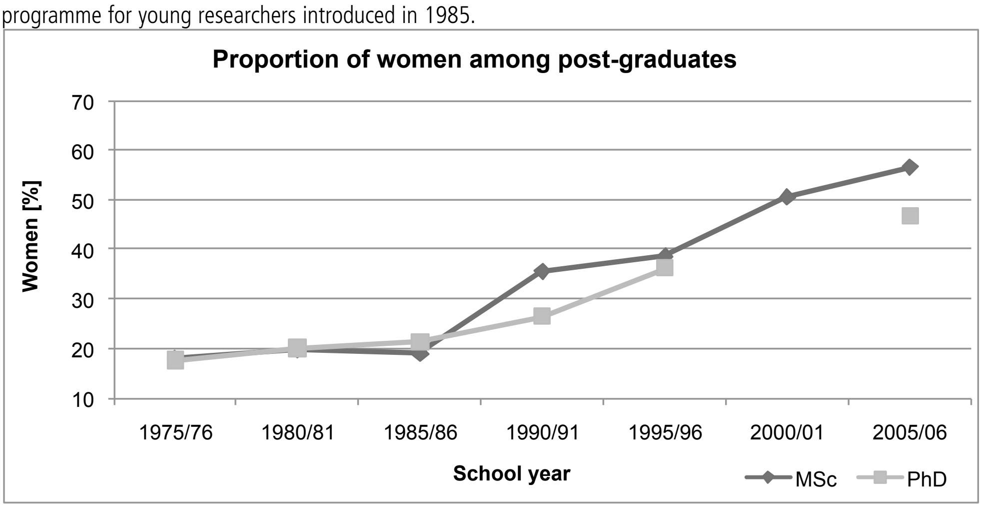
During the transitional period, the number of women students increased from 32.3 % in 1950, 42.5 % in 1970 and 55.6 % in 1990 to 60.1 % in 2005. The proportion of women graduating increased even more, from 30.6 % in 1950 and 59.6 % in 1990 to 64.1 % in 2005, showing that females were more successful in finishing their studies than their male colleagues (see Figure 3). Despite the fact that over half of the students at the two Slovenian universities in the 1990s were women, when it comes to the question of a scientific career, less than 10 % of full professors were women.

Figure 4. Number of post-graduate students getting their Masters or Doctoral degree.



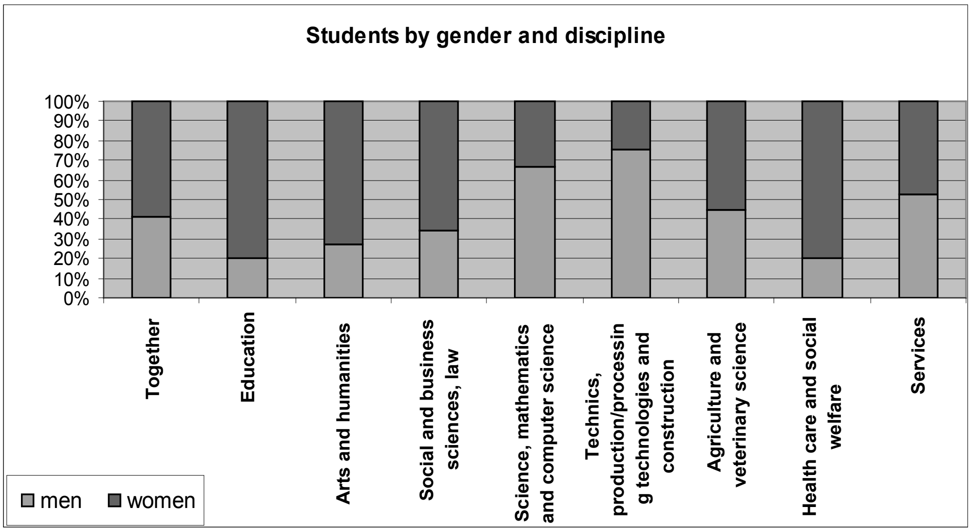
The number of successful postgraduates in Slovenia largely increased with the introduction of a special funding scheme for young scientists in 1985. The result was that 5 years later instead of having 178 (as in 1985/86) there were 466 students getting MSc (see Figure 4) and 35.6 % of them were women (see Figure 5). The number of successful PhD students also grew, but not so rapidly and in 1995/96 among all PhDs 36.2 % were awarded to women, compared to 20 % in 1985/86. At this stage we can already see a drop in the proportion of women, from almost 60 % graduating at university to 38.7 % getting MSc and 36.2 % getting PhD (all in 1995/96). When it gets to the number of women holding higher position in education, the situation is much worse with about 20 % women among assistant professors, 15 % among associated professors and only 10 % of full professors. The transitional period was additionally characterised by the increased difficulty for women to get employed, especially with respect to younger women with higher education (which usually meant they had not yet had children), as there was a fear that they would soon go on maternity leave.

Figure 5. Proportion of women getting Masters and Doctoral degres at Slovenian universities. Already at the beginning of the transitional period this number increased significantly, mainly due to the special funding programme for young researchers introduced in 1985.



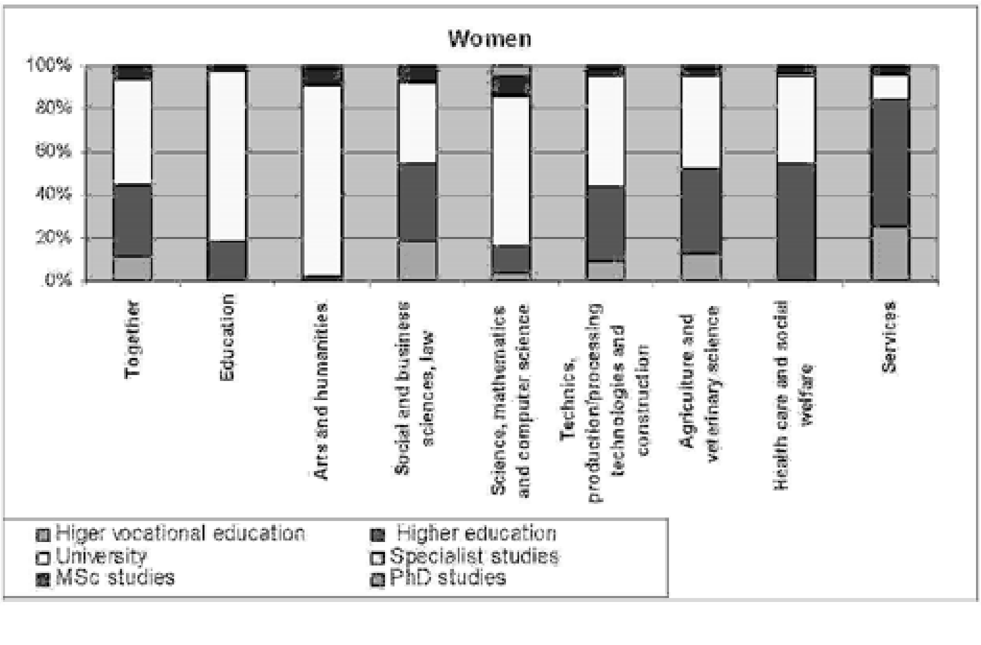
Since the government has been giving the largest part of financial support for education and science since socialism, we can not observe any special changes in the last 10 years that would change or particularly influence gender equality. However, many changes have been, and are still being, made to the financing system in general, mainly balancing between senior and junior researchers and basic vs. applied research. It is difficult for young scientists regardless of their gender to get established, especially taking into account the limited funding available for all scientists. It is important to say though, that there is a growing awareness of the young researcher problematic and that since 1985 the research community of Slovenia is offering special funding for graduate students and post-doctoral researchers. This greatly increased the number of students getting their Masters (from 178 in 1985 to 466 in 1990, as shown in Figure 4) and to a lesser extent also Doctoral degres (from 89 in 1985 to 121 in 1990, as shown in Figure 4).

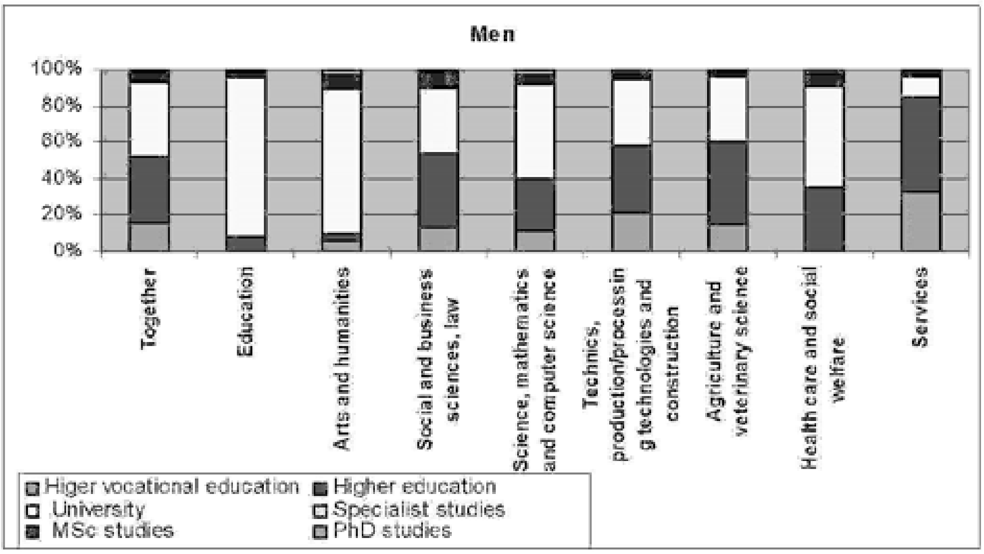
Figure 6. Students by gender and discipline. Source: Statistical Office of the Republic of Slovenia, data for 2005.



Observing the number of students by gender and discipline in Slovenia shows that in 2005/2006, 60 % of students were women (the first column in Figure 6) forming the majority of students in Education (80 %), Arts and Humanities (72 %), Social Sciences (68 %) and Health Care (80 %). If we analyse proportions of women having different education levels for each discipline (Figure 7), we can see that even though the proportion of women compared to men inside the discipline labelled as 'Science, math and computer science' is lower (33 %), women inside that discipline study for higher degrees than men. Almost 5 % of all women compared to almost 3 % of all men in that discipline are on a PhD programme. Higher percentage of women compared to men is evident not only in the PhD programme but also on MSc and university programme of a 'Science, math and computer science': 8.6 % of women and 5.2 % of men are on MSc while the majority is on a University Degree (70 % of women and 52 % of men). In general compared to other disciplines 'Science, math and computer science' seems to encourage PhD study for men and women, the proportion of students on a PhD programme is the highest compared to the other disciplines (4.8 % and 2.9 % for women and men respectively compared to the second highest for women 1.7 % on 'Mechanical Engineering and Construction' and the second highest for men 2.2 % on 'Arts and Humanities'). On the other hand, even though the majority of students in 'Health Care' are women (80 %), men in that discipline go for higher degrees than women, 7 % and 2 % of men studying 'Health Care' are on MSc and PhD respectively (compared to 3 % MSc and 1 % PhD for women).

Figure 7. Proportion of students with different levels of higher education by discipline (women, men). Source: Statistical Office of the Republic of Slovenia, data for 2005.





WOMEN STUDIES

In the 1980s and 1990s many different societies and organisations were established promoting equal opportunity and addressing different issues concerning of women and society. Under the influence of EU initiatives in the 2001, the National Committee for Women in Science was established at the Slovenian Ministry of Science, Education and Sport.

Introduction of gender issues in higher education resulted in a number of research activities and international publications. Still, one of the major problems remains securing funding for research of women issues and gender equality. This is partially due to the limited national budget for research in general and high competition at the national level, where most of the evaluators are still men who do not recognise the importance of gender related research. The other obstacle is the occasional influence of people with political power expecting that the research should address issues relevant for supporting some politically influenced hypotheses, such as Christian Democrats promoting studies that would confirm the importance of increasing the role and dependence of women in family life. As the influence of other countries helped to introduce gender issues in education, the next step in the development of national awareness regarding gender issues will probably be influenced by the activities in other countries, especially recommendations issued by the EU.

SCIENTIFIC CAREERS

Scientific careers and family life

It is known that wages in research and education are rather low, especially for young people, which makes it difficult to have a family. A particular problem is expensive housing and the high cost of real estate around bigger cities, where most scientific work is going on. Slovenia has a population of about 2 million and it is slowly decreasing, as most couples opt for one child. There have been some efforts made to encourage larger families. For instance, maternity leave can be divided between the parents; the financial support replacing the salary approximately equals the average of the last 12 month salary. The situation regarding financial support for maternity leave in the neighbouring country Croatia was similar to that under socialism and shortly after. However since the late 1990s financial support for scientists during the first 6 months of their maternity leave reflects their salary while for the next 6 months it drops drastically (to the level of the general national average income), sometimes amounting to only 25 % of the support in the first 6 months. This practically means that most women in science in Croatia are only taking 6 months' maternity leave. It is worth pointing out though that the time of maternity leave is used to extend the habilitation time or the duration of the graduate scholarship, making this situation easier for women.

Daily care is also often a problem, not only due to the long waiting time for public pre-school care units but also due to the limited time the facilities are open and relatively high expenses associated with that. In most cases pre-school care is not as critical as the primary school situation, where many schools have morning and afternoon lessons interchanging weekly. For smaller school children the problem is also in the limited school capacities for extended afternoon care in primary schools. What may be helpful when having small children is the possibility to work part of the time from home.

The new generation of young researchers

The new generation of researchers tends to have a substantially different view on research and life than senior scientists. This is partially due to the transition from the politically influenced scientific hierarchy during the socialist era. While most senior scientists still function in 'the old way' expecting young researchers to build their careers in a similar way they did, the new generation expresses more freedom and criticism regardless of a person's position. A senior researcher is judged by the new generation primarily based on research achievements and personal quality and not on formal power or position. Globalisation and the Internet have largely contributed to the independence of young researchers, as most of the research resources are freely available and accessible. This was not the case in the early 1990s.

As in many other countries, one of the expectations has been that a woman in a leading position should follow established (commonly male-shaped) behaviour patterns and difficult conditions for getting promotion often resulted with most successful scientists being rather aggressive. Maybe in the past this was the only way to survive in male-dominated science. Unfortunately, in many cases, scientists are still functioning along the same patterns, fighting for promotion of their own researchers/students commonly also by suppressing others. They are usually afraid of having many young women working with them as they expect potential problems with their promotion (the same as they encountered when building their own career).

Recruitment into science: choosing hard or soft sciences

Women are mostly opting for soft science, partially under the influence of stereotypes that are still present in education and educational materials, partially influenced by their, possibly traditional, parents and current trends in society. Unfortunately, most of the positions commonly associated with women are undervalued and underpaid. The known problem is underpayment in education, especially in primary and secondary schools, while at the same time 90.9 % of students (in 1998/99) at the Faculty for Education are women.

An interesting observation in changing trends concerns computer science which was very popular in the 1980s having 40 % of women students. At that time, it was not considered as technical as nowadays, but was rather perceived at the level of natural sciences. In the late 1990s and early 2000s with the fast changing technology, computer science got the label of being very technical. At the same time in the secondary school programme it was degraded to a supportive discipline mainly providing knowledge on using basic computer tools (for editing text, drawing pictures, preparing presentations) to support work in other areas. One of the reasons for omitting the study of algorithms and algorithmic reasoning when approaching problems, data structures, programming, etc. in secondary schools was also the difficulty in getting teachers, as that kind of knowledge usually makes it possible to obtain much better paid position in the private, and sometimes also the public, sector. The current hope is that trends (which have proved to have large influence on the choice of scientific topics) will help by re-promoting computer science, once it becomes clear that there is a shortage of experts in the area.

By early 2006 Slovenia had 23 women with a PhD in Computer Science (17 graduated from University of Ljubljana out of a total of 87 graduates and 6 from the University of Maribor out of 47 graduates). By the middle of 2006 there were 29 women and 400 men that had received a PhD in Electrical Engineering at the University of Ljubljana and 6 women and 87 men at the University of Maribor. By the same time 11 women and 241 men had received a PhD in Mechanical Engineering at the University of Ljubljana and 7 women and 92 men at the University of Maribor. By the middle of 2006, 14 women and 77 men had received a PhD in Mathematics at the University of Ljubljana and 6 women and 10 men at the University of Maribor.

Images of science

In Slovenia during the transition period and accession to the EU, the image of science in society was not very good, partially due to the publicly known problem of low salaries in research and education and rather long time needed for finishing education. This is a problem especially with the hard sciences (e.g. computer science), where there are good job opportunities for people with university education that do not require further education, often offering the possibility of getting promoted to a leading position and ending up with much a higher salary than a scientist colleague. During the last few years, it has been especially difficult the attract women to the technical sciences, as the image of science seems to be dropping which is partially the result of the influence of the media and the film industry that rarely promote science and instead concentrate on images of other professions such as lawyers, medical doctors or managers.

In Slovenia, there is an urgent need to work on the image of science in general and also in particular of computer science in secondary schools, where the national curriculum is not really managing to avoid treating computer science as learning basic usage of computer programmes for editing, calculating and preparing presentations. There exist movements in Europe for the popularisation of science, that among other issues also consider gender differences.

Mobility of researchers

International scholarships facilitate some mobility of researchers, but having a family forces most of the potential applicants to choose between career (mobility) and having a family. Having small children usually means fewer possibilities to travel and attend conferences and networking events, which consequently means less possibility for cooperation and mobility in the future.

As researchers usually have a passion for freedom in selecting the topics of their work, this often means a relatively low salary compared to the level of education, as long as it enables a decent life and working conditions. This is also the case in Slovenia, where the transitional period resulted in a relative drop in scientific incomes but the possibility of involvement in European projects (TEMPUS, COPERNICUS, ERASMUS, etc.) enabled good quality working conditions. It is true that there are Slovenian students abroad, especially on high quality natural science PhD programmes in the US, but most of them are maintaining a connection with the scientific community in Slovenia and plan on returning after getting their degree. We can say that the issue of brain drain is currently not a problem in Slovenia, but this does not mean that there should not be some actions to stimulate the return of young scientists. For instance, the well-known problem at universities is a fairly limited number of professorship positions that are very hard to get for someone with a PhD obtained abroad, regardless of their scientific quality and relevance for the programme.

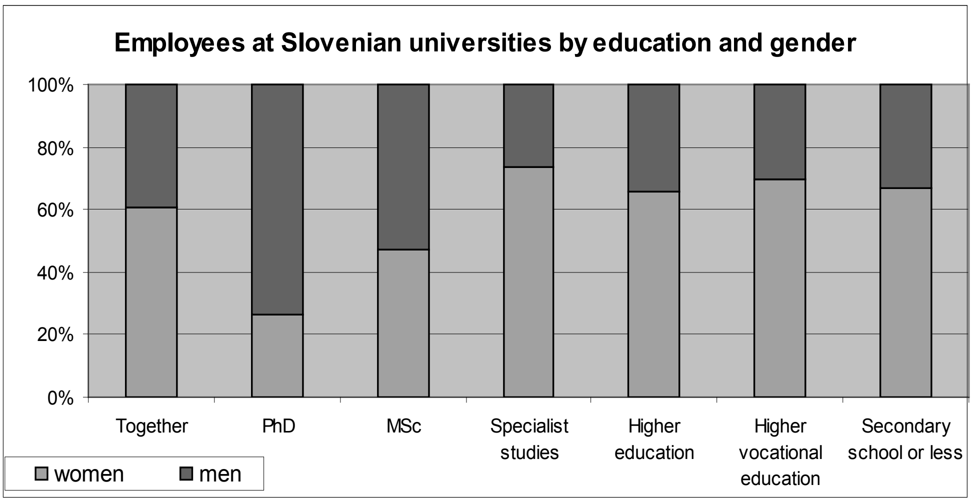
Participation of women scientists/researchers in EU projects

The participation of women in EU projects is reasonably supported in Slovenia, partially due to the good level of information available to all scientists and the availability of materials to everyone with access to the Internet. It is true that there are no specific actions encouraging women to participate in EU and international projects, but as proposal writing requires a lot of non-attractive work and represents a high-risk investment of research time, women tend to get involved (maybe because women are traditionally used to high investment for undervalued work). Actually one of the first EU IST RTD 5FP projects with scientific coordination in Slovenia, was coordinated by two women. We can also see that the proportion of women in EC bodies of EU projects is rather high as well as among national contact points. In FP5 Slovenia had 24 observers and experts in Programme Committees, 8 of them women (33 %); in FP6 there were 30 observers and experts from Slovenia, 10 of them women. Slovenia had 19 national contact points in FP5, 4 of them women (21 %) while the situation improved with FP6 with Slovenia having 58 % of women (7 out of 12) among national contact points (Blagojevič et al, 2004).

Employment of researchers

Researchers in Slovenia are mainly employed by universities and research institutes. In 2005, 60 % of all employees at universities in Slovenia were women, mainly occupying lower education positions. As shown in Figure 8, out of 400 employees holding a PhD only 27 % were women, while 47 % of those having MSc were women.

Figure 8. Percentage of men and women employed at Slovenian Universities by education. Source: Statistical Office of the Republic of Slovenia, based on data for 2005.



Women constitute a good third of all researchers in Slovenia (35 %). The majority of researchers in Slovenian are employed in natural science (80 %), lead by the business sector where over 98 % of researchers are in natural science (see Figure 9). In the business sector the majority of researchers are men (75 %), while in the government sector 43 % are women (see Figure 10). The private and non-profit sector has only a small proportion of all researchers (31 out of 7,644 researchers) and they are mostly men (88 %). While 60 % of all employees at universities are women, only 36 % of all researchers employed in the higher education sector are women.

Figure 9. Percentage of researchers by sector of employment. Source: Statistical Office of the Republic of Slovenia, based on data for 2005.

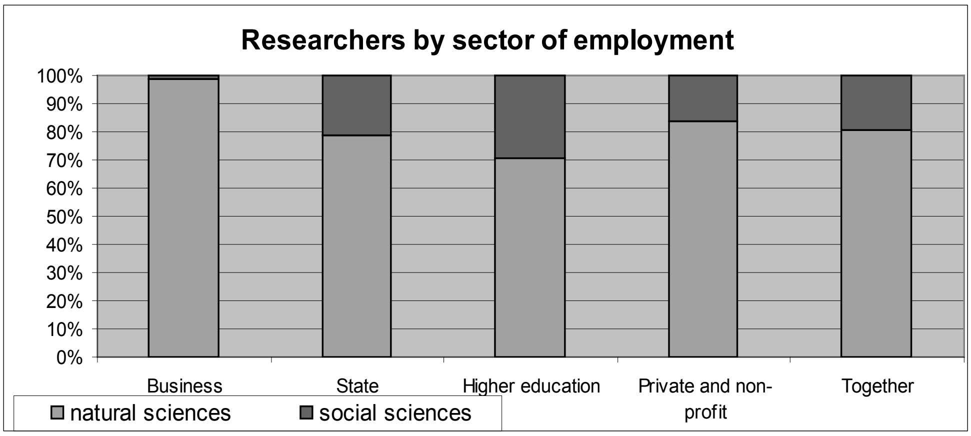
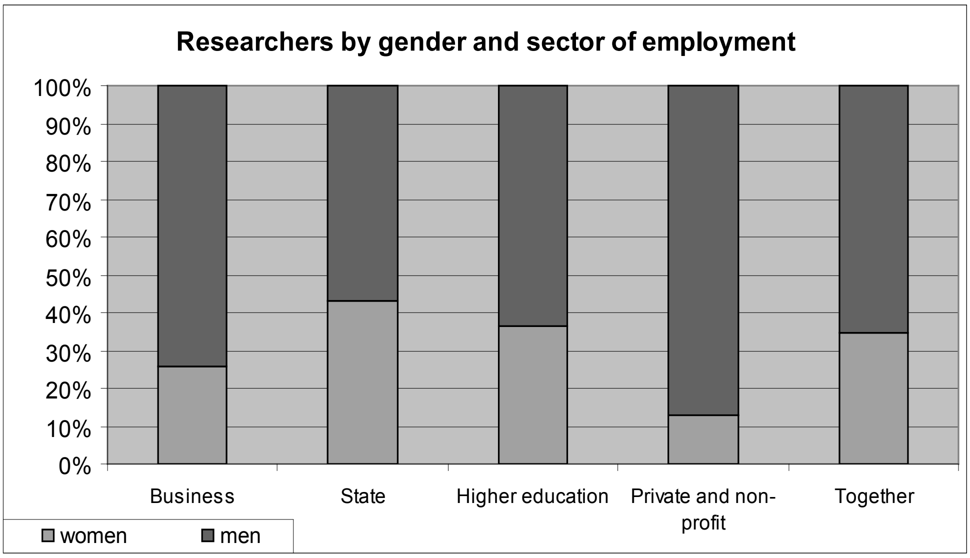
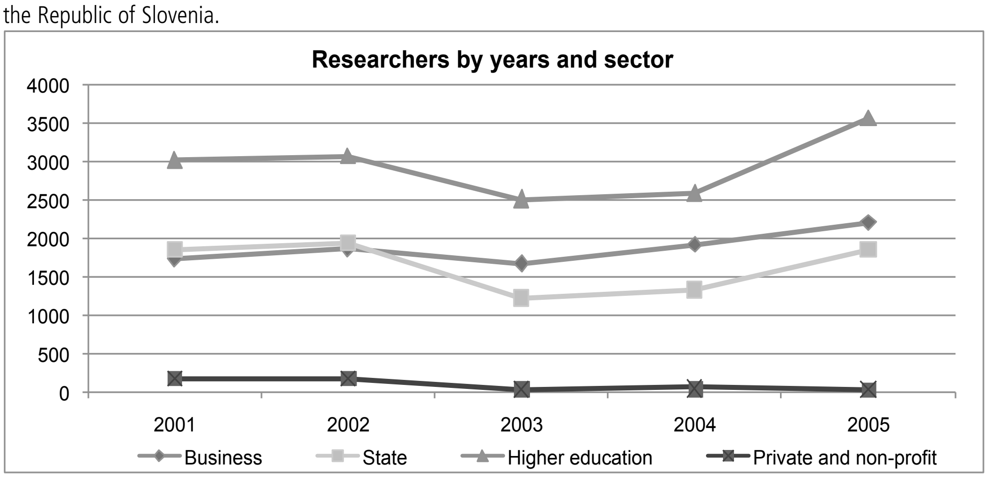


Figure 10. Percentage of researchers by gender and sector of employment. Source: Statistical Office of the Republic of Slovenia, based on data for 2005.



The total number of researchers in Slovenia is growing and this is evident in all but the private and non-profit sector (Figure 11). There was a drop in the number of researchers in 2003 that may need more investigation, but in general the number of researchers is growing from 6740 researchers in 2001 to 7644 researchers in 2005. The most stable is the business sector while the state sector and higher education are closely following each other in growth, with higher education having 3564 and the state sector having 1846 researchers in 2005.

Figure 11. Number of researchers in Slovenia by sector over five years (2001–2005). Source: Statistical Office of the Republic of Slovenia.



Main employment opportunities for researchers in Slovenia are at public research institutes and universities. Companies in Slovenia can register as primarily research companies, but they represent a small proportion of companies. In 2006 there were 294 such companies, they were employing 1170 people. Table 2 gives details according to disciplines.

Table 2. Number of companies registered for research activities and the number of employees. Source: Statistical Office of the Republic of Slovenia, annual report of companies for 2006.

Subclasses of activities (SKD)	Number of companies	Number of employees
73.101 – Research and experimental development in the field of natural science	43	127
73.102 – Research and experimental development in the field of technology	194	888
73.103 – Research and experimental development in the field of agriculture and related activities	3	1
73.104 – Research and experimental development in the field of medicine	15	31
73.201 – Research and experimental development in the field of sociology	32	104
73.202 – Research and experimental development in the field of humanities	7	20
Total:	**294**	**1,170**

Bibliography

Blagojević, M., Bundule, M., Burkhardt, A., Calloni, M., Ergma, E., Glover, J., Groo, D., Havelková, H., Mladenić, D., Oleksy, E.H., Sretenova, N., Tripsa, M.F., Velichová, D., Zvinliene, A. (2004), Waste of talents: turning private struggles into a public issue, Women and science in the Enwise countries, (Science and society). Luxembourg: Office for Official Publications of the European Communities.

Jogan, M., Status of women in science in Slovenia (in Slovene). Report, University of Ljubljana – Faculty of social sciences, 1997.

Jogan, M., Sexism in everyday life (in Slovene). Ljubljana: Scientific library, Faculty for social science. 2001.

Jogan, M., Women in Academy and Hidden Discrimination – the Case of Slovenia, In Researcher 20: 44-54, 2000.

Jogan, M. Fischer, J., Končar, P., Košak M., Rener, T., Boh, K., Miloševič, V., Women and Discrimination, 59-66, Delavska enotnost, Ljubljana 1986.

Research Results no. 644. (in Slovene). Ljubljana: National statistical office, 1995.

Žnidaršič, S.Ž., Ora et labora - women be quiet (in Slovene). Overview of demographics in Carniola and employment of women in 1880-1910, Ljubljana 2000.

European Commission, Women and Science – Mobilising women to enrich European research (COM-1999 76), accessible via Europa website at: http://europa.eu.int/comm/research/science-society/documents_en.html, 1999.

6FP ERA project CEC-WYS: Central European Centre for Women and Youth in Science (2004-2007) (SAS6-CT-2004-003582), www.cec-wys.org

Annexes

Translated by Tanja Brajnik

OFFICE FOR EQUAL OPPORTUNITIES: SOME CRUCIAL QUESTIONS ABOUT WOMEN IN SCIENCE AND RESEARCH

Sonja Robnik, Office for Equal Opportunities of the Republic of Slovenia

The Office for Equal Opportunities which took over the functions of the Women's Policy Office (established in 1992) was established by the Government of the Republic of Slovenia as a central expert body. This decision was reached on 15 February 2001. The Act on Equal Opportunities for Women and Men, Official Journal, no. 59/02, from 2002 additionally defined the importance of equal opportunities for women and men. The Office for Equal Opportunities organises different events and activities through which it tries to fulfil its tasks. Once such event was the debate on women in science organised on 7 March 2007. The purpose of this debate was to raise the issue of the difficulties faced by women in science and research. The data shows that at higher education levels the proportion of women who have successfully finished their BSc degree is higher than that of men. Among postgraduate students, however, the proportion of women drops – most evidently at PhD level. Consequently, the proportion of women working in science and research is much smaller than that of men. Besides gender segregation according to scientific field (the number of women is higher in medical and social sciences, whereas men prevail in natural and technical sciences) there is also vertical gender segregation, which is evident from an extremely small percentage of women occupying the highest positions in science and research. In their work, women scientists and researchers are faced with different, often hidden, obstacles which hinder their work and advancement. At the debate, the following problems in particular were addressed.

RECONCILIATION OF FAMILY AND WORK, EQUAL EMPLOYMENT OPPORTUNITIES

Like in other fields of work, in science too women are the ones who take on the greater share of responsibilities for home and family. According to the recommendation of the Enwise Expert Group (Blagojevič et al. 2004), companies should encourage the representation of women by creating a family-friendly environment. The actual proposals discussed at the debate referred to the increase of sensitivity to equal opportunities and the introduction of measures to the responsible employees in the human resources department (parental obligations) as well as to the setting up of a network providing self-help for parents with small children and organizing child care services (within an organisation). At the debate a proposal was put forward that universities and scientific institutions should establish a department or appoint a person responsible for activities which would encourage women in science and help implement the policy of equal employment opportunities.

INFORMATION FLOW, KNOWLEDGE TRANSFER AND CO-OPERATION

Also pointed out at the debate was insufficient information flow between political institutions, research institutions and media and the lack of close co-operation between economy, education and science. The findings of the research on equality between women and men in science and research (Mladenić, 2006), which were presented at the debate, added to the already enumerated problems of weak co-operation between non-government organisations and state authorities. Since co-operation between women scientists is weak as well, the appropriate solution would be to establish an expert organisation and a network of women in science.

VERTICAL AND HORIZONTAL SEGREGATION, BALANCED GENDER REPRESENTATION AND AWARDING

Despite the fact that more women than men successfully finish their BSc degree (63.2 % in 2004), the share of women at postgraduate levels decreases (56.4 % of MScs and 40.6 % of PhDs in 2004). With academic titles the differences become even higher (11.1 % of full professors, 21.9 % of associate professors, 34.6 % of assistant professors in 2001). Gender differences can be observed also in the highest Slovenian sciences and arts institution – among 99 elected full and associate members of the Slovenian Academy of Sciences and Arts there are 4 women. The loss of women on the career ladder is accompanied by the horizontal segregation – women PhDs prevail in the fields of education, the humanities and arts as well as in the fields of health and social services. The smallest number of women are active in the fields of mechanical engineering, production and civil engineering. A solution for reducing this kind of segregation can be found in the proposal to encourage girls to study technical sciences and to choose a profession in one of these fields. Another problem raised at the debate was the unbalanced gender structure of commissions, committees and other working bodies in science and research. The Commission for the Promotion of Women in Science is trying to ensure gender balanced awarding of scientific accolades, however, the fact remains that most awards for scientific accomplishments are presented to male scientists.

INCOME GAP

The Commission for the Promotion of Women in Science collected data on gross incomes of employees in public research institutions (2001–2003). The findings revealed that the annual income of women with a PhD, MSc or BSc is on average lower than the annual income of men. Women also received a smaller position supplement (PhDs in 2003 51.7 %, MScs 68.7 % and BSc 53.4 % in comparison to men respectively).

PRIVATE RESEARCHERS

The debate furthermore emphasised the fact that women scientists and researchers are not a homogeneous group either. Private researchers are faced with even greater difficulties (e.g. childcare leave, sick leave) which also affect their financial situation. Another problem which was addressed at the debate was the issue of entering bibliography into the national bibliographic database COBISS (unresolved question regarding the person responsible for the free entering of bibliography).

ROLE OF THE MEDIA

Another topic highlighted was the role of the media in creating the image of science. The popularisation of science should be based on the presentation of the creative side of scientific and research work, its ability to stir the imagination, its adventurous spirit and the unique charm of uncovering universal secrets. It was established that one of the ways to break the stereotypes about women in science would be to increase the number of articles presenting successful Slovenian and foreign women scientists.

BIBLIOGRAPHY

Blagojević, M., Bundule, M., Burkhardt, A., Calloni, M., Ergma, E., Glover, J., Groo, D., Havelková, H., Mladenić, D., Oleksy, E.H., Sretenova, N., Tripsa, M.F., Velichová, D., Zvinliene, A., Waste of talents : turning private struggles into a public issue, Women and science in the Enwise countries, (Science and society). Luxembourg: Office for Official Publications of the European Communities, 2004. 174 pp., ilustr.

Mladenič, D., Slovenian national contribution on women and science, Enwise working paper, 2003.

Mladenič, D. (ur.), Enakost žensk in moških v znanosti in raziskovanju v Sloveniji. 1. natis. Grosuplje: Partner graf, 2006.

INCOMES OF EMPLOYEES IN PUBLIC RESEARCH INSTITUTIONS IN 2001, 2002 AND 2003

Polona Novak, Slovenian Research Agency

In November 1999 the European Commission established the Helsinki Group for Women and Science. The aim of the Helsinki Group is to achieve balanced co-operation of both genders in the field of research in Europe, with the intention to optimise the efficiency of the research system and to improve the connection between science and society. On the initiative taken by the Helsinki Group at the European Commission, the Ministry of Education, Science and Sport appointed the Commission for the Promotion of Women in Science in May 2001. One of the most important tasks of the Helsinki Group and the Commission for the Promotion of Women in Science is to set up a statistical base for women in science.

On the initiative of the Commission for the Promotion of Women in Science, the Science Office at the Ministry of Education, Science and Sport collected data on gross incomes of the employees in public research institutions according to gender, education and research title for 2001, 2002 and 2003. We studied data on gross incomes with all supplements and separately also position supplements and incentives. Position supplements and incentives were studied separately because we were interested in linear changes in supplements and in the effect the supplements have on income differences. We collected data on gross incomes of regular staff in full-time employment. The observed period was one year. With this criterion we eliminated those differences in incomes which are the result of shorter working hours or of a smaller amount of working hours in a one-year period. The data on income with comments, explanations and graphs are provided on the web site http://www.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/znanost/place_JRZ_2001-2003.pdf.

INCOME DEPENDENT ON EDUCATION AND GENDER

The data from all three years of research show – for women as well as for men – that the income is dependent on education and on the research title: with higher education the income is on average higher and with a higher research title the income is higher as well. In the highest three educational groups (PhD, MSc and BSc) the average gross income of men is higher than the income of women.

Even more characteristic is the difference in average position supplements. In the observed period (2001–2003), the average position supplements for women in the highest three educational groups were always considerably lower than the supplements of men. In the whole observed period, women in the highest three educational groups received at most a supplement of 68.7 % of that received by men (in 2003 with an MSc degree). In 2001 women with a PhD degree on average received only 46.2 % of the position supplement granted to men, in 2002 51.1 % and in 2003 51.7 %. In 2001 a huge difference can be observed at MSc level: women received merely 26.0 % of the supplement granted to men. In 2001 women who graduated with a BSc degree received 33.5 % of the supplement in comparison to men, in 2002 29.0 % and in 2003 53.4 %. The absolute amount of position supplements is not very high therefore the difference in the absolute amount is not considerable either. In 2001 women with a PhD degree on average received a position supplement which was 92,801 SIT[1] (Slovenian tolars) (EUR 387) lower than the supplement of men in the same group. Or, in other words, the supplement of men was 2.16 times the supplement of women. This amount represents only 1.5 % of the average income of men in the studied group. In the same year the supplement of women with an MSc degree was on average 71,071 SIT (EUR 297) lower than the supplement of men. This means that their supplement was 3.8 times the supplement of women. In this same year men in the next educational group (a BSc degree) received 3 times the supplement of women.

The research on incentives for the highest two educational groups revealed the following: the higher the education level, the higher the incentive and, what is more, men always received a relatively higher incentive than women. The differences in incentives are quite considerable. In 2001 women with a PhD degree on average received only 72.3 % of the incentive granted to men, in 2002 76.7 % and in 2003 78.0%. In 2001 women MScs were granted 66.8 % of the incentive given to men, in 2002 84.1 % and in 2003 86.3 %. The absolute amount of the incentive is higher than the position supplements and this is why in some cases – although the difference expressed in percentage is smaller – it amounts to a greater absolute difference. In 2001, for example, women PhDs received an incentive which was on average 102,591 SIT (EUR 428) lower than the incentive of men (72.3 % of the incentive of men). In 2002 women in the same educational group on average received 93,886 SIT (EUR 392) less than men (76.7 % of the incentive of men).

INCOME DEPENDENT ON RESEARCH TITLE AND GENDER

As a general rule, the employees in the highest three educational groups are included in research on income according to research titles where the differences and interdependencies are expressed even more significantly. During the researched period men received higher income than women regardless of the title. The most considerable difference in 2001 could be observed in the group with the highest research titles[2] where women received only 87.3% of the gross income of men. This means that they on average received 1,050,810 SIT (EUR 4,385) less than men with the same research title. In 2002 and 2003 the income differences in the group with the highest titles were a little bit smaller. In 2002 the income of women was equal to 91.3 % of the income of men (on average 800,667 SIT (EUR 3,341) less) and in 2003 to 91.9 % (776,622 SIT (EUR 3,241) less).

Figure 1. Average gross income with supplements according to gender and research title (source: Ministry of

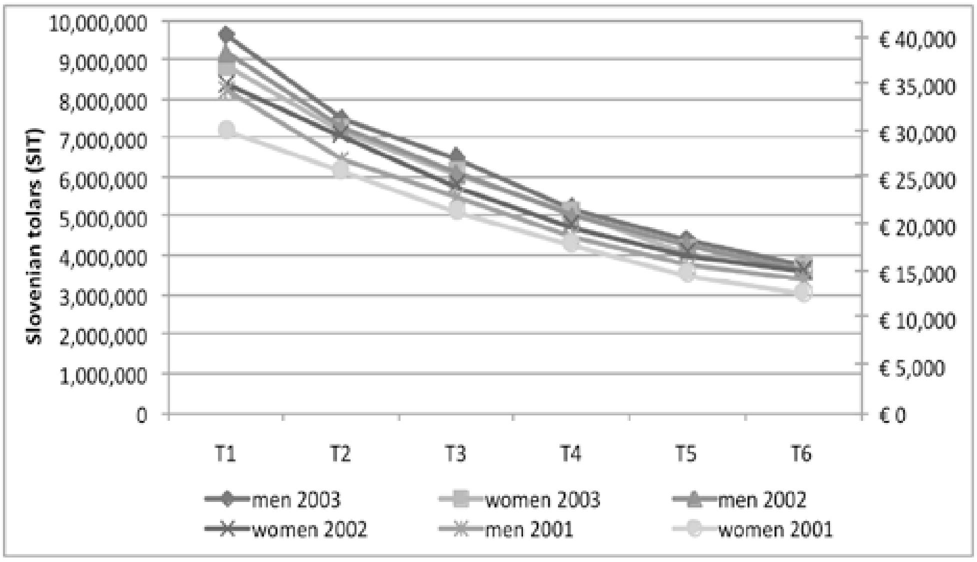
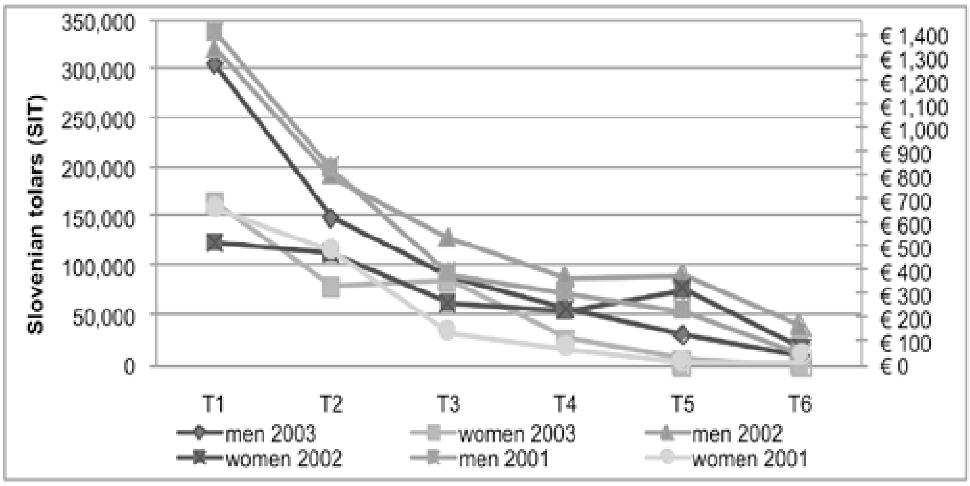


Table 1. Research titles grouped according to the income. We have labelled them here T1 through T6 to simplify reading of Figure 1, Figure 2, and Figure 3.

T1	T2	T3	T4	T5	T6
• scientific councillor, • expert and research councillor, • development councillor, • full professor – scientific councillor, • research and development councillor, • freelance expert associate – expert on humanistic science	• senior scientific associate, • senior expert and research associate, • senior development associate, • associate professor – senior scientific associate, • senior research and development associate, • freelance expert on humanistic science	• scientific associate, • expert and research associate, • development associate, • assistant professor – scientific associate, • research and development associate, • expert on humanistic science	• assistant with a PhD degree, • senior expert and research assistant, • freelance developer, • senior research and development assistant	• assistant with an MSc degree, • senior assistant • senior developer, • assistant – expert	• assistant (researcher, BSc degree), • assistant, • developer

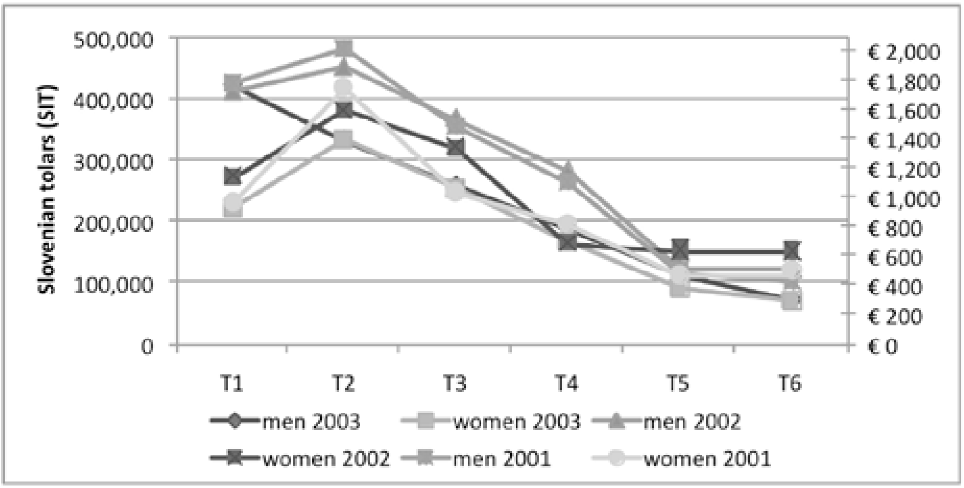
Employees with a higher title received a higher average position supplement and the average position supplements of women were during the entire researched period and for all titles lower than the supplements of men. In 2001 women with the highest titles received merely 47.2 % of the position supplement of men or, in other words, the supplements of men were twice as high as those granted to women. In 2002 women received 38.8 % of the supplement of men, which means that the supplement of men was 2.6 times the supplement of women. The absolute amount revealed that this was the year with the greatest difference: women on average received 197,335 SIT (EUR 823) less than men. In 2003 the supplement of women amounted to 54.3 % of the supplement of men. In the next group[3] the situation was not much better: in 2001 women's supplement was equal to 58.7 % of men's supplement, in 2002 to 59.2 % and in 2003 to 53.2 %.

Figure 2. Average position supplement according to gender and research title (source: Ministry of Education, Science and Sport, Science Office).



In the group with the highest academic titles, where the differences between the absolute average amounts of position supplements are the greatest, the income differences according to gender are explained with position supplements of 17 %–25 %. In this group the differences in position supplements equal to only 1.5 %–2.2 % of the gross income of men. In other groups the differences in position supplements during the observed period explain up to 40 % of gender differences in gross income.

Figure 3. Average incentive according to gender and research title (source: Ministry of Education, Science and Sport, Science Office).



The linear changes in incentives reveal that the highest incentives were granted in the second group of titles[4]. With lower positions the connection between the title and the incentive was the same as with the position supplement. This means that the employees with higher titles received higher incentives. The average incentive received by women was lower than the average incentive received by men in the same year. Cases when women received the same, or even a slightly higher, incentive in comparison to men were exceptional. In 2001 women in the group with the highest titles received only 54.6 % of the average incentive of men, in 2002 66.0 % and in 2003 52.8 %. In the next group (beginning with the title senior scientific associate), in which the absolute amount of incentives is the highest, the differences are relatively smaller. In 2001 women in this group received 86.7 % of the incentive of men, in 2002 84.5 %, whereas in 2003 they exceeded the average incentive of men by 0.7 %. With regard to incentives, the greatest absolute difference can be observed in the group with the highest academic titles where in 2001 women on average received 193,017 SIT (EUR 805) less than men (i.e. 54.6 % of the incentives given to men). In 2003 they received 198,934 SIT (EUR 830) less than men (i.e. 52.8 % in comparison to men).

When the income differences according to gender are explained by the differences in the received incentives, one can see that incentives can be compared to position supplements: in the group with the highest titles the gender difference of 18 %–26 % in the average gross income is explained by the gender difference in the received incentive. In other groups the higher incentives of men explain a different share of higher incomes of men and they explain a difference of 50 % at most. The absolute difference in higher position supplements and incentives of men is only rarely the reason for more than 60 % higher income of men. Generally, the explanations can be obtained for up to 50 % of the difference.

CONCLUSIONS

The collected data indicates typical gender discrimination affecting employees in the public research sector in terms of gross income as well as in terms of position supplements and incentives. Generally, men receive higher average position supplements than women, which means that they are more often appointed to decision-making positions and that they are appointed to positions with a higher financial value. An example of such a function is the position of director of a public research institution. During the period researched, only one third of all directors were women. A similar situation can be observed in the management of organisational units – research groups in public research institutes: only 30 % of all groups are headed by a woman. The proportion of women in the decision-making positions outlined are equal to the share of women in the presented data for the group with the highest research titles. Under the assumption that most financial resources are used as position supplements paid to the directors and the heads of groups we can conclude that women occupying the same decision-making positions receive smaller position supplements. The gross incomes of men, which are on average higher than the incomes of women, are not solely the consequence of higher average position supplements and of the incentives granted to men. When we subtract position supplements and incentives from the average gross income based on the research title, it becomes evident that as in the case of gross income with supplements based on the title, in the period researched the incomes of men in all groups were higher that the incomes of women in the same group respectively. When compared to men, women's gross incomes without supplements are on average 0.7–11.7 percentage points lower.

Slovenian legislative regulation includes principles which do not allow any form of discrimination. With prohibition of gender discrimination in the Constitution of the Republic of Slovenia, gender equality is recognised as the basic principle of democracy as well as human rights and as such it is the basis for a welfare and constitutional state. With regard to gender discrimination the *Act on Equal Opportunities for Women and Men* was adopted in the Slovenian legal order (Official Journal, no. 59/2002, coming into effect on 20 July 2002). This is an umbrella act. Later on, the *Act on the Implementation of the Principle of Equal Treatment* (Official Journal, no. 50/2004, coming into effect on 7 May 2004) was adopted on the basis of the legal framework. Subordinate legal regulations were adopted or are being prepared as well. Legal regulations are the foundation for the elimination of gender discrimination. The results of the implementation of these regulations will be seen only after some time, as will their effectiveness.

The umbrella act was adopted during the time when we were collecting data on gross income according to gender, education and research title. The second act was passed later and this is why the collected data according to gender for 2001, 2002 and 2003 constitute the foundation or the starting point. The data for the following years will be studied and analysed as well and on the basis of this we will determine the effect of legal regulations and the consequent reduction or even elimination of discrimination. This is why it is necessary that we continue collecting data according to gender, education and research title in the field of science. The collection and analysis of data is only one of the tasks which will enable the elimination of gender discrimination. This task was undertaken by the Commission for the Promotion of Women in Science in order to achieve the set goals.

WOMEN AND SCIENCE – ONLY DIFFERENCES

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We can approach the question of women in science scientifically, with exact research work and statistical examination of where women are in the field of science – and above all, where they are not. Where they are hidden and not present, from what they are excluded. This is of course a very important moment of the feminist analysis: it needs to be determined exactly how many women are present in different fields of work, at different levels, in different spheres, to what extent they are discriminated, why they are trapped in domineering relationships more than men – always and everywhere. This is necessary in science and in politics (Bahovec, 2005), in knowledge and in 'authority' which is infinitely connected with knowledge. However, the problem, women and science, is even broader. The problem in not only the absence of women, the inaccessibility of such a traditional domain as science to women. The problem arises from the paradoxical relation between this notorious absence and at the same time some excessive, excessively obvious, excessively (negatively) determined presence. They are present, exactly, as women whom gender determines more than men as 'human beings in general' – who are first of all something more specific, less universal. Examples of this excessive presence – of this 'surplus' of femininity in the scientific discourse, can of course be found everywhere.

Already in her first book Primate Visions, which is a published version of her biological thesis, Donna Haraway studied the experimental practice of one of the most influential researchers of the woman's soul from the second half of the previous century, Harry Harlow, and the scientific fantasy of his 'laboratory mother' with whom he experimentally replaced the biological mother of young chimpanzees. In his 'purely' scientific analyses sadism, which is not limited to the brutal treatment of chimpanzees in the laboratory, and misogyny, which greatly surpasses the usual talk about women, are intertwined to the extreme. However, they become obvious only after we start reading the initial experimental reports, when we go through the ways of cracking jokes, when we become deeply engaged in the ways of forming discourse practices which are the basis for the whole experimental procedure and which deeply affected the results of 'pure' science. When the artificial mother, which had a wire skeleton and a changing appearance – at one time it had a friendly smiling face and at another it was a monstrous creature without a head (or tail) – 'mutated' into the variant with icy cold water which it poured over the baby chimpanzee clasping to her, Harlow wrote: 'What can be even worse than an icy cold wife? An icy cold mother.' And as he was thinking about different variants of the laboratory mother, about scientific variables for which a certain 'constant' can be determined, he also started thinking about the best possible mother, a harbinger of the forthcoming best possible world. He described her as follows: 'When we devised this surrogate mother, we were not dependent on the capriciousness of the evolutionary processes. … We designed an efficient body with perfect proportions, stripped of unnecessary bulges and appendices. We avoided redundancy in the system of surrogate mother by reducing the number of breasts from two to only one.' (Haraway, 1996, p. 138).

The morals of this story are: the scientific method is not and cannot be neutral and objective, the view of a scientist is always an interested view. This is a view from above, the view of the master of souls and bodies and not a view from the side, from some other perspective, which at the same time enables the constitution of some other object of science, some other truth without leading into the relativism of Feyerabend's famous criticism of science with the principle 'anything goes'. Only a small shift, a tiny change of perspective and instead of the figure we see the background, some completely different universe. This is just the kind of change Thomas Kuhn writes about in his book The Structure of Scientific Revolutions: instead of two faces turned towards each other we suddenly see in the space between them a bright chalice of intoxication from our history of literature. Feminism is such intoxicating, inspired science. But it is also a cheerful science.

'Cheerful science': this means that we do not constantly take offence at the horrors which are (were) done to women and that we do not constantly get angry about Nietzsche's genealogical dimension das ewig weibliche. What seems the most questionable is some other 'eternity' – the eternal position of women as victims, in the perspective from which feminism simply cannot escape (Brown, 1995). The continuous returning of the idea about 'the eternal feminine' must therefore be placed in opposition to the idea about das ewig mysoginische: as far back as we can reach, so far back in the history of science we can find that women were perceived as negativity and a source of evil; judging from the accessible written documents this is true at least until Christine de Pizan and her Book of the City of Ladies in the late middle ages, and probably much further back in history; it coincides with the emergence of culture itself which was, in the middle of the previous century, treated by Simone de Beauvoir in her continuously popular The Second Sex (Beauvoir, 1999 and 2000). This, however, cannot divert us from the feminist laughter and joy – laughter when we are dealing with the nonsense and madness of history and joy with which we can change the dark and destructive side of history. In contrast to the pessimistic idea about Minerva's owl which spreads it wings as the dusk falls, feminism prefers to follow the inspiration of Nietzsche's Prince Vogelfrei (Nietzsche, 2005) who can be the harbinger of the dawn of some new, feminist version of the middle in the Ancient Greece, mesothes. Feminism is 'free to fly', in contrast to philosophy it does not come too late and in contrast to futuristic science (and cyberfeminist science fiction) it does not predict a better future. It is positioned exactly, here and now, in our feminist, i.e. gender marked, version of ontology of the present time, ontology of ourselves. Feminism is the right measure which clearly shows what has become of women in human society. It is 'high noon'.

This is why the classic feminist question 'Is the future a woman?' can be replaced with the question that is even more classic: 'Is truth a woman?'. The truth is more on the side of the excluded, abstract, non-thematic than on the side of 'positive' knowledge. The truth is on the side of something that 'our' science cannot think and does not know how to do so - although almost everything it cannot surmise is almost always wrapped into a preliminary judgment and covered with a verdict and although womanhood is presented as the worst of all possible evils, as demonic, as monstrous, and even though this is in the next step proclaimed as such because of its primal nature and its deepest essence.

This is why women in science and in history are forced to make an impossible choice. Or more exactly: what defines them as women is exactly the impossible choice itself – the choice as impossible: either the mirror of a man, a feeble reflection, a complete copy, only an echo and a print of the male/human model which 'gives the man a double enlargement of his picture' (as Virginia Woolf wrote in her A Room of One's Own), an ill-bred, deformed, crippled man: not a human being in general, and neither only the 'other' of this 'human being', but a failed human being, a complete freak (Tuana, 1995). Right in the heart of negativity which it abolishes – the negativity of womanhood which is being abolished by feminism – a powerful scientific revolution can become possible after which the scientists will see the same object from a different perspective, the background of a figure and at the same time, as Thomas Kuhn wrote, literally start living in a different world.

BIBLIOGRAPHY

Bahovec, E. D. (ed.), Women and Governance, Faculty of Arts and Society for Cultural Studies, Ljubljana, 2005.

Beauvoir, S. de, The Second Sex, Penguin, Harmondsworth, 1984.

Brown, W., States of Injury. Power and Freedom in Late Modernity, Princeton University Press, Princeton, New Jersey, 1995.

Harding, S., The Science Question in Feminism, Cornell University Press, Ithaca in London, 1986.

Haraway, D., "Metaphors into Hardware: Harry Harlow and the Technology of Love", in: Primate Visions, Verso, London and New York, 1989, pp. 231-243.

Haraway, D., "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective", in: Simians, Cyborgs, and Women. The Reinvention of Nature, Free Associations Books, London, 1991, pp. 183-202.

Kuhn, Thomas, The Structure of Scientific Revolutions, University of Chicago Press, Chicago and London, 1970.

Nietzsche, Friedrich, The Gay Science, Vintage Books, New York, 1974.

Tuana, N., Less Noble Sex. Scientific, Religious and Philosophical Conceptions of Woman's Nature, Indiana University Press, Bloomington in Indianapolis, 1993.

Endnotes

1 1 = 239.640 SIT

2 These are the titles listed in Table 1 under T1: scientific councillor, expert and research councillor, development councillor, full professor – scientific councillor, research and development councillor, freelance expert associate – expert on humanistic science

3 These are the titles listed in Table 1 under T2: senior scientific associate, senior expert and research associate, senior development associate, associate professor – senior scientific associate, senior research and development associate, freelance expert on humanistic science.

4 These are the titles: senior scientific associate, senior expert and research associate, senior development associate, associate professor – senior scientific associate, senior research and development associate, freelance expert on humanistic science.

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Reclaiming a Political Voice:
Women and Science in Central Europe

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