

The historic role of women scientists at BGS and a look at what is happening today ... by Catherine Pennington



[Dr Emily Dix](#) of the University of Wales and her assistant Miss Elsie White.

Pioneering women geologists: a rarity of their time.

This may surprise you if you know the BGS today but from its inception in 1835, and for over 100 years thereafter, the British Geological Survey was an exclusively male preserve. Women just weren't allowed in, especially if they wanted to be a scientist, involved in any fieldwork or, dare I say it, *marry*.

A man's world...

It was the same for much of Britain at the time. In 1900, most jobs for women were in the domestic service industry or other 'semi-skilled' activities¹. The two world wars changed the situation dramatically as women took on the roles previously occupied by the now absent men. This was, in the most part, only ever supposed to be temporary; the men would return and the aspiring women would go back to ... what? As a result, many women objected to being evicted from the jobs they were doing and this was seen across the professions in Great Britain.



[Dr Dorothy Hodgkin](#), exceptional biochemist of both Oxford and Cambridge

Universities and mother of three. She was awarded the [Nobel Prize in Chemistry in 1964](#) and is credited with the development of protein crystallography. She remains the only British woman to have ever received a science Nobel and her portrait hangs in the [National Portrait Gallery](#).

Photograph from [DorothyHodgkin.com](#)

The [Sex Disqualification Act of 1919](#) was designed to remove barriers to women in particular professions but still the majority of female roles were administrative or supportive; it was very difficult, if not impossible, for a woman to gain a senior role in any organisation. This act was also supposed to prevent discrimination against married women but the assumption that a mother could not devote time to both a job and a family prevailed. The Civil Service (including BGS), councils and the teaching profession managed to retain a clause of the 1919 Act that meant that women who wanted to marry had to leave their jobs.

It was not until the [Sex Discrimination and Equal Pay Acts of 1975](#) came into force that BGS, and the rest of working Britain, could not force women to resign should they marry.

Women scientists

The early female scientists had a number of common characteristics²: They were often born into influential families with an elevated position in society meaning they had access to the privilege of education and could work voluntarily. They were able to work for no or reduced pay and usually no status as they often had a private income or were supported by a man. It was common for male scientists to have women assistants, and male geologists of the time encouraged women to do some of the more time-consuming work of writing and illustrating. These women received little academic credit for their research that was frequently incorporated into the publications of the men for whom they worked. It was common for women to publish their own scientific work anonymously or under the name of a male relation.

The [Geological Society of London](#), established in 1807 to cater for the needs of professional geologists, did not permit female membership until it was forced to in 1919; the [Royal Society](#) did not allow women in until 1945. The exception to this is the [Geologists' Association](#) where women and men had equal member rights from its inception in 1858. This society, however, devoted itself to the *amateur* geologist so would have been considered a suitable place for women to 'play scientist'.

All these attitudes seem very archaic now, ludicrous even. For the hundred years after BGS began, a range of women struggled against this discrimination, married or not. Survey archives suggest that no women were recruited until the 1920s when an advertisement for geologists included the statement that women candidates:

"...must be unmarried or widows and will be required to resign their appointment upon marriage"

These women had to prove themselves to be so extraordinarily brilliant, standing head-and-shoulders above all others, to even be considered a likely candidate for a scientific job at BGS. One such female geologist was Eileen Hendriks who, despite having a PhD and a great deal of experience and enthusiasm, failed to secure a

permanent scientific position at BGS in 1930.

The first female scientists employed at BGS



Eileen Guppy – the first female geology graduate to be appointed to the scientific staff at BGS

Before the Second World War the only women to be permanently employed by the Survey with degrees in geology were recruited as technical assistants: Miss Odell (Palaeontology) and Miss Eileen Guppy (Petrology).

Almost certainly because of her gender, and despite her qualifications, Eileen Guppy spent many years working in roles subordinate to senior male staff. However, in 1943 she was promoted to the rank of assistant geologist becoming the first female geology graduate to be appointed to the scientific staff of the Survey. Despite becoming known for her thoroughness and attention to detail, and contributing to several publications, she was demoted once the war had finished. She continued, however, working in a unique position as a personal scientific assistant at Senior Experimental Officer grade to the Directors Sir William Pugh and Sir James Stubblefield. Latterly she worked as Secretary for the new Atomic Energy Division and during 1963-5 she worked with Inspectors from the Public Record Office evaluating the older records from the Geological Survey and Museum. When she retired in 1966 she was awarded the MBE for her loyal service.

In other areas women were being employed to meet the added demands of the war. Helen Pocock and Sheila Warner joined the Drawing Office as the first female draughtswomen. Water supply during the war was vital, particularly in the London area, and several women graduates known as "Water Babies" carried out an inventory of water bores and wells. This was done mainly on bicycle and was the only opportunity for women to carry out fieldwork.



Dr Dianne Knill, the first woman to be appointed as a geologist at BGS

From the 1950s onwards more women were being employed. In 1957 Dr Dianne Knill, with a PhD from Imperial College, joined the Survey to carry out optical mineralogy. Unaware of the breakthrough she had achieved, she was the first woman to actually be appointed as a geologist.

Another woman to break through an even more difficult barrier was Sue Arnold who became the first to conduct research at sea. In 1967 she joined an all-male crew on the MV Moray Firth IV in the Irish Sea. Sue carried out work at sea for the next ten years.



Audrey Jackson,
first field geologist at BGS

Geological mapping had always been considered unsuitable for women and it wasn't until 1972 that Audrey Jackson, a Trinity College Dublin graduate with previous field experience, was employed at BGS. She was the first female geologist to spend extended periods of time, over several years, in the field as a geological mapper.

When the 1975 Sex Discrimination and Equal Pay legislation came in, more pioneering women were employed at BGS. A particular example is the Environmental Protection Unit (EPNU; later the Fluid Processes Unit) which was set up at Harwell in the late 1970s. In the

early 1980s the Unit had eight female scientists employed out of the thirty staff. There was an ethos of gender equality amongst the staff which included the previously contentious issue of women doing fieldwork. The Unit was viewed as unusual at the time and several of these women went on to more senior positions including Dr Jean Alexander and Professor Julia West. The rest of BGS was still a very much male dominated environment but ENPU certainly helped change the culture so that more female staff were employed across the organisation over the following thirty years.

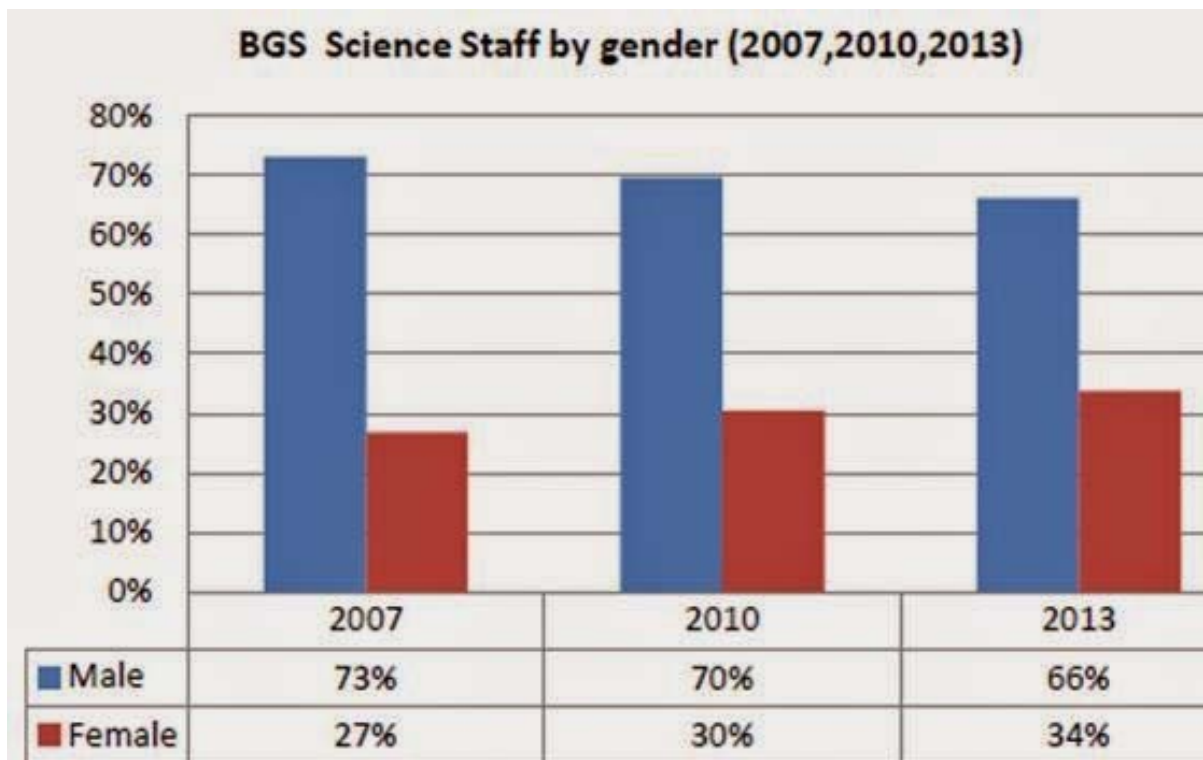
Equality still on the agenda today

Somewhat remarkably, this issue is still on the political agenda today as the country recently asked itself: **why are there such few women in senior jobs?** Indeed, this is reflected in such public-facing positions as government and the question as to [why women are under-represented](#) in the public sector has been repeatedly asked. Phrases such as “old boys network” and “women being shut out” are banded around Parliament. [David Cameron has recently tried to address this](#) stating he wanted one third of his ministers to be female and that organisations not filling half the senior posts with women are missing out on “more than 50 per cent of the talent”. Still there are only five female cabinet ministers out of the 22. It is the same in the Science, Technology, Engineering, Mathematical and Medicine industries (STEMM) as Edwina Dunn ([Women in Business Series](#)) explains:

“It is well acknowledged within STEMM industries that women are heavily underrepresented in the workplace. Excluding medicine, approximately 17% of STEMM professionals are women, despite women making up 46% of the UK’s workforce; within the engineering sector, this figure stands shockingly at just 8%”.

So how do the figures measure up at BGS today?

From the 1970s onwards, BGS has seen a vast number of talented and experienced women employed across the board and ultimately strives for a 50/50 gender balance in their staff across all grades. However, when you look at the figures of male/female scientific staffing (see graph), things still appear to be male dominated BUT the gap is closing and there are various reasons for it.



The balance of scientific staff at BGS by gender in 2007, 2010 and 2013 as published in the [Athena Swan Application](#)

The first reason is that there are simply **fewer women in the physical sciences** field, which includes geology. In fact, the Higher Education Statistics Agency data shows that only 37.3% of PhD researchers in physical science areas are female. This figure is comparable to the 34% figure for female scientists employed by BGS. As a comparison, the gender balance in other closely-related scientific fields such as biological or environmental sciences has a percentage of female PhD researchers at 61%. The Geological Society of London reports that less than 20% of their fellows are female. All this goes some way to explaining that, in terms of early-career recruitment at BGS, there are double the number of male applicants compared to female.

The second reason is that many of the **scientific staff near retirement age are male** and were employed in the 1970s when female staff were a rarity. Once these male scientists retire, the gender balance will equalise further.

The issue still remains, however, that there are few women in senior positions.

How is BGS working to improve the situation?



BGS is the first [NERC](#) institute to have recently received the [Athena Swan](#) accreditation. Athena Swan aims to improve the career opportunities for both men and women equally in the STEMM subjects and this provides a specific action plan to tackle gender issues. This accreditation process is not just a box-ticking exercise. It is continuous and requires BGS to establish a multi-disciplinary team to oversee the action plan, gauge the current situation and demonstrate progress.

In fact, **BGS has been actively addressing gender issues** since the 1990s because, to achieve its scientific aims, it is important to attract and retain excellent scientists. In April 2013, a Diversity and Equality Group was established to provide a more focused effort in identifying priorities and actions, and further the progress already made. Career progression has been a main focus encouraged by workshops, drop-in sessions, mentoring, training courses and fellowships. A range of measures such as flexible working, career breaks and maternity/paternity/parental leave are in place to support career progression and further enhance the inclusive culture at BGS. BGS is now working towards Silver with Athena Swan and you can read the details of the BGS application [here](#).

A look to the future...

Writing as a female geologist at BGS today, I can tell you that the opportunities for women are, thankfully, a far cry from the world where it would be unthinkable for a woman to be considered a scientist. The idea that a woman had to choose her career over her marriage or family life seems nonsensical in today's context. In fact, the working conditions at BGS could not be more supportive of this and BGS is actively striving to ensure that women are no longer discriminated against in science.

It is a complex issue and will, of course, take a number of years to create an equal gender balance at BGS hence the need to continue the progress already made and to have a strong programme within the Athena Swan initiative. Professor John Ludden, executive Director of the British Geological Survey, says:

"BGS is very pleased to have been awarded with the Athena Swan Bronze award. This will provide an added impetus to BGS to enhance its programmes in diversity in employment in working towards a silver award in the future".

¹[Women in the Workforce](#)

²[The Role of Women in the History of Geology](#)

See also [Women in Geology at BGS](#)

Catherine Pennington