A LAB OF ONE'S OWN

SCIENCE & SUFFRAGE IN WORLD WAR ONE

DR PATRICIA FARA
PRESIDENT OF THE BRITISH SOCIETY FOR THE
HISTORY OF SCIENCE



Suffrage at Cambridge

Newnham laboratory

Newnham father



'...there is a regular manufactory of very advanced women going on at Cambridge...'

Suffrage at Cambridge

'Cambridge has become a centre of activity – meetings, debates, plays, petitions etc all through the term...'

Newnham maths student, 1908



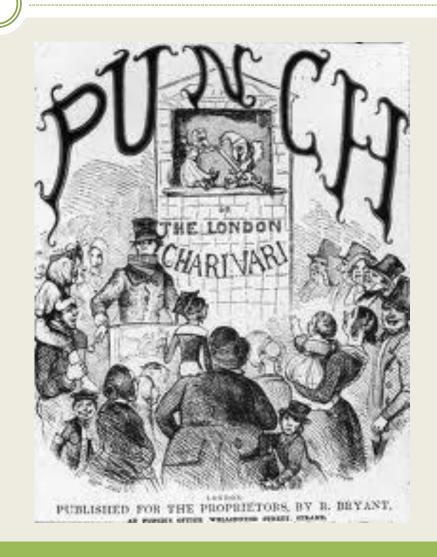
Punch (1884)

The Woman of the Future! She'll be deeply read, that's certain,

With all the education gained at Newnham or at Girton;

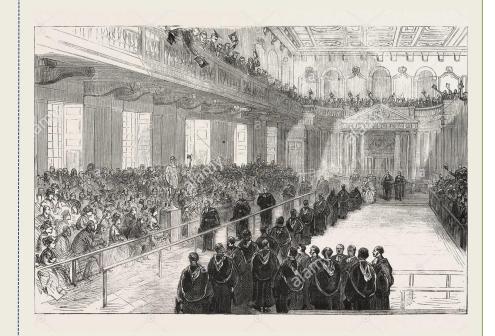
She'll puzzle men in Algebra with horrible quadratics,

Dynamics and the mysteries of higher mathematics.



Maths Tripos results

'The Moderator stood there waiting till the noise was hushed, and then the words rang loud through the Senate House: "Above the Senior Wrangler, Fawcett, Newnham." The shout and the applause that rang through the building was unparalleled in the history of the University.' (1890)



Philippa Fawcett

Hail the triumph of the corset

Hail the fair Philippa Fawcett

Victress in the fray

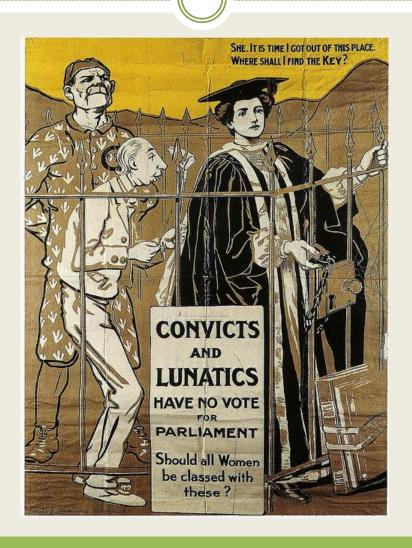
Crown her queen of Hydrostatics

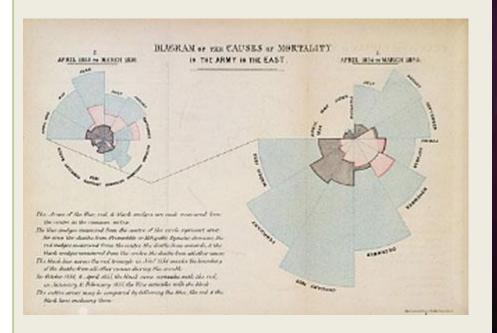
And the other Mathematics Wreathe her brow with bay.





Suffrage banner

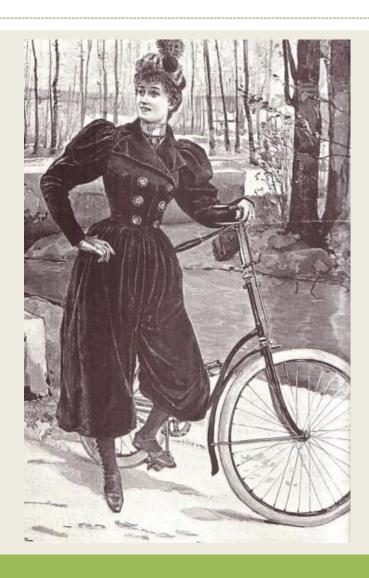




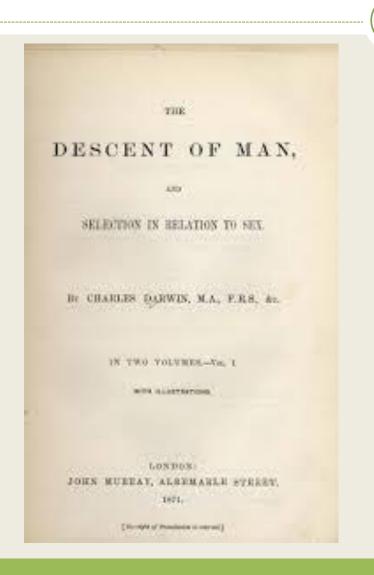


Suffragists embrace technology





Charles Darwin and evolution



'The chief distinction in the intellectual powers of the two sexes...is shown by man's attaining to a higher eminence in whatever he takes up, than can woman - whether requiring deep thought, reason, or imagination, or merely the use of the senses or the hands.'

Suffragists and evolution

'The woman of political and social activity will be different from the domestic woman...just as palaeolithic man differs from his neolithic brother.'

Votes for Women, 1911

STUDIES IN NATURAL HISTORY.

The Antysuffragyst or Prejudicidon.



The Antysuffragyst or Prejudicidon. This curious animal has the smallest brain capacity of any living creature. Its sight is so imperfect that it cannot see further than the end of its nose; but it has a wonderful capacity for discovering the stupefying plant called "Humbugwort," on which it feeds voraciously. It is closely allied to the Lunaticodon, and it is a fierce enemy of the Justiceidon.

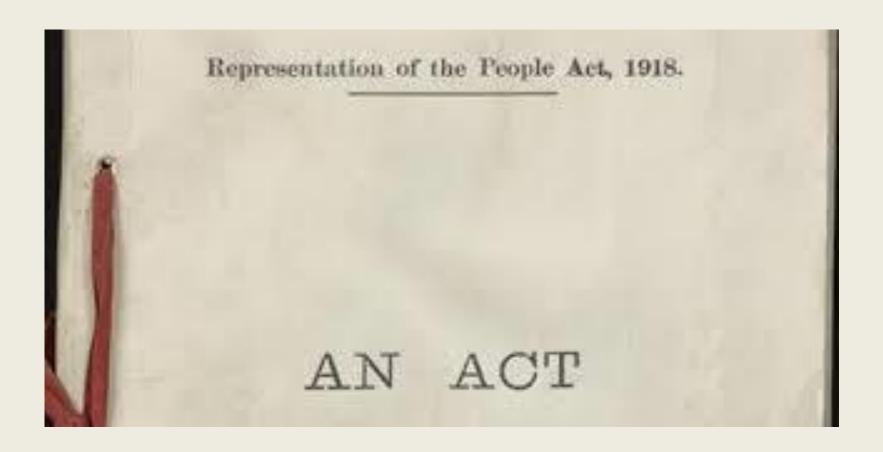
Suffrage & War



'...it is not too much to say that our Armies have been saved and victory assured by the women in the munition factories where they helped to produce aeroplanes, howitzer bombs, shrapnel bullets, shells, machine tools, mines, and have taken part in shipbuilding.'

Minister of Munitions, 1916

Women over 30 gain the vote



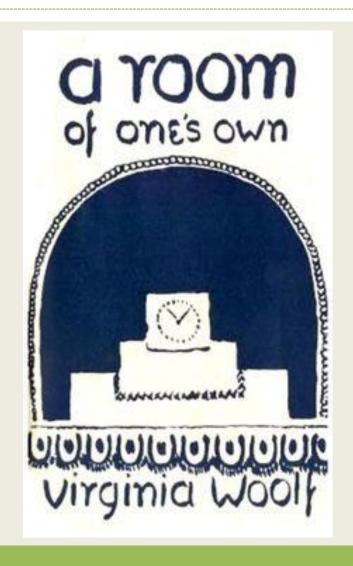
Millicent Fawcett

'The war revolutionised the industrial position of women. It found them serfs, and left them free.'

1919



Votes v Money



'The news of my legacy reached me one night about the same time that the act was passed that gave votes to women... Of the two – the vote and

the money – the money, I own, seemed infinitely the more important.'

A LAB OF ONE'S OWN

1. Scientific Outsiders

2. Medicine

3. Scientists as Leaders

4. Post-War Reactions

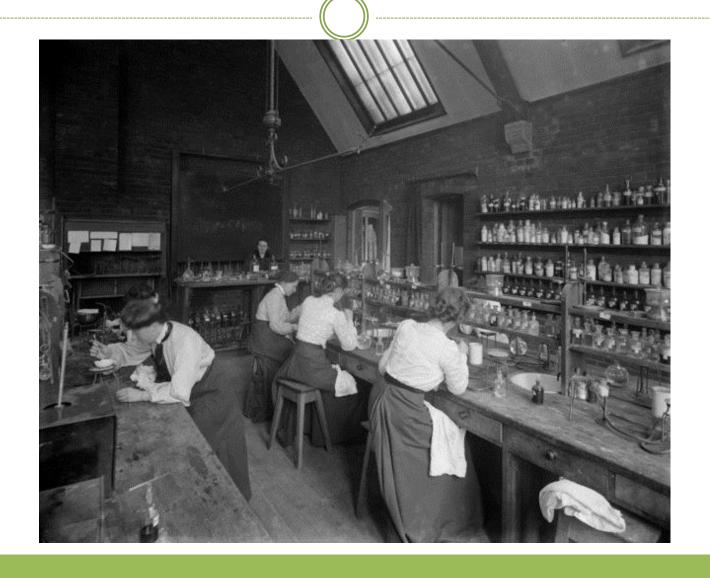
1. SCIENTIFIC OUTSIDERS



'Women high up in scientific positions, women with international reputations...are shut out from the concourse of their intellectual fellows.'

Marie Stopes, palaeobotanist, 1914

Girton College, Cambridge (c. 1900)



Hertha Ayrton (1854-1923)



'I do not agree with sex being brought into science at all. The idea of "woman and science" is completely irrelevant. Either a woman is a good scientist, or she is not.'

Hertha Ayrton as insider



- 1881 Gained a Certificate in Mathematics at Cambridge (Girton College)
- 1889 Became first female member of the Institute of Electrical Engineers
- 1904 Read her paper at the Royal Society
- 1906 Won Hughes' medal at Royal Society

Suffragette supporter





Hertha Ayrton as outsider

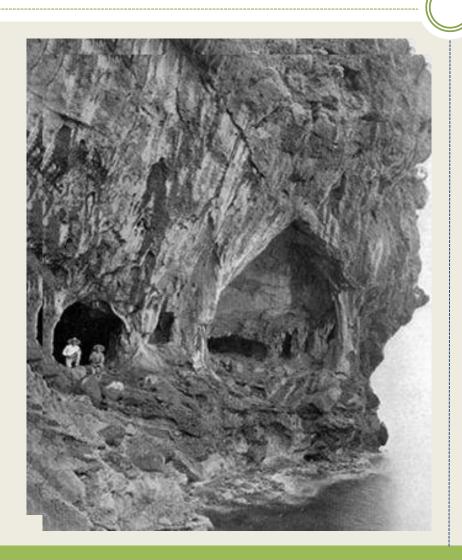


- 1881 No degree in Mathematics at Cambridge
- 1902 Rejected for Fellowship of the Royal Society
- WW1 Flapper fan ignored

Museum curators

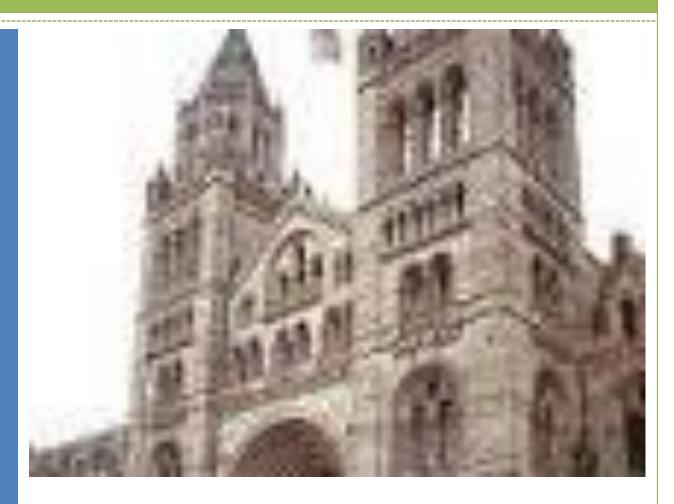


Dorothea Bate



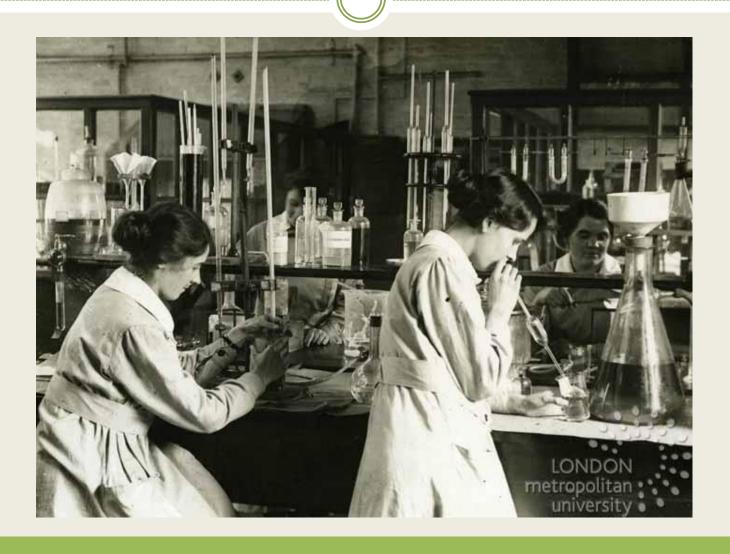


Dorothea Bate: 37 years classed as a temporary unofficial scientific worker



Natural History Museum

University Researchers



University Researchers

'I was one of the workers in the preparation of diethylamine [needed for drugs] some weeks ago and should be glad to hear of any further help I could give. I can put all my time and energy at your service for the next 6 weeks, and am anxious to know whether the few helpers down here could not be allowed to contribute further to the needs of the country?..I, for one, am willing and eager to give up all ideas of holiday while there remains so much to be done.'

Margaret Turner, University College of Wales, 1915

30 women in Royal Flying Corps drawing office

Misses Lodge & Jackson supervised fly room (insecticides)

Women allowed to lecture

8 women test explosives in the experimental trench



Women's war work at Imperial College

Martha Whiteley



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Martha Whiteley



'I naturally tested this property by applying a tiny smear to my arm and for nearly three months suffered great discomfort from the widespread open wound it caused in the bend of the elbow, and of which I still carry the scar.'

1953

Little recognition

Letter to War Committee

"...the workers who remained with me gave up many opportunities for professional advancement. I mention these facts as an index of public spirit with which these women gave their services, services which have not received any public recognition.'

St Andrew's University, 1919

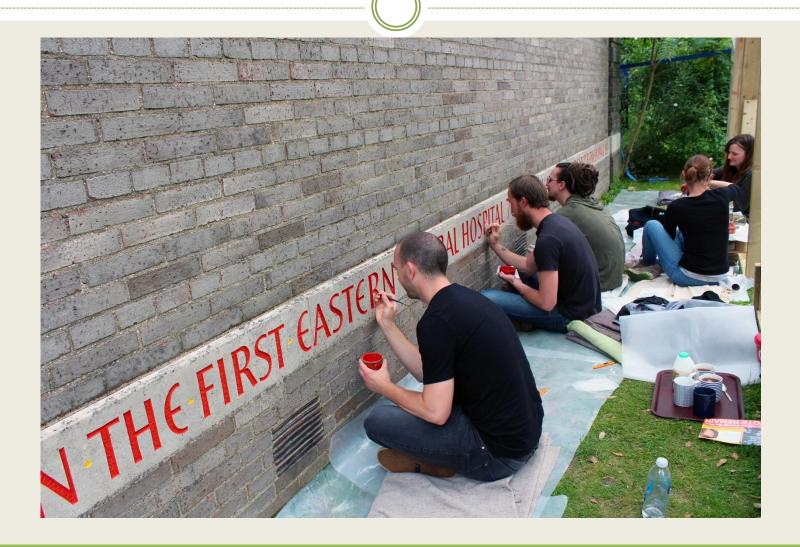


2. MEDICINE

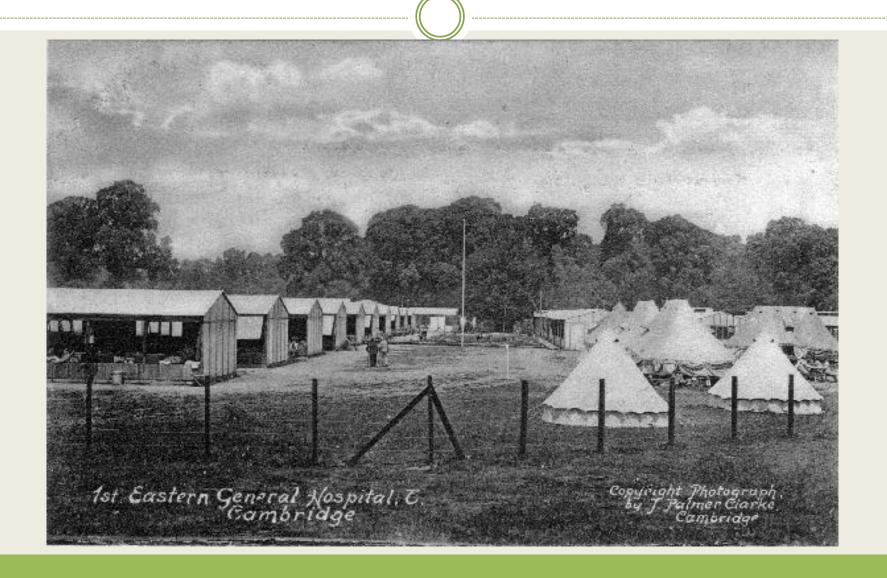




War & Cambridge



War & Cambridge



London School of Medicine for Women



'Go home and keep still'...the commanding officers 'do not want to be troubled with hysterical women.'

War Office, 1914



Dr Elsie Inglis

France

Scottish Women's Hospitals

Dr Frances Ivens

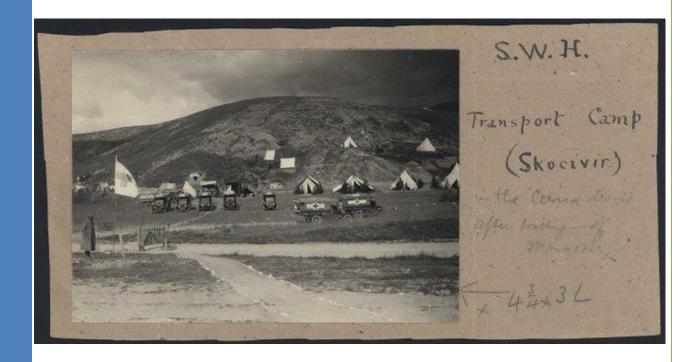
Cistercian Abbey at Royaumont



Serbia

Scottish Women's Hospitals

Transport camp with ambulances and tents





Doctor at Was and Proce



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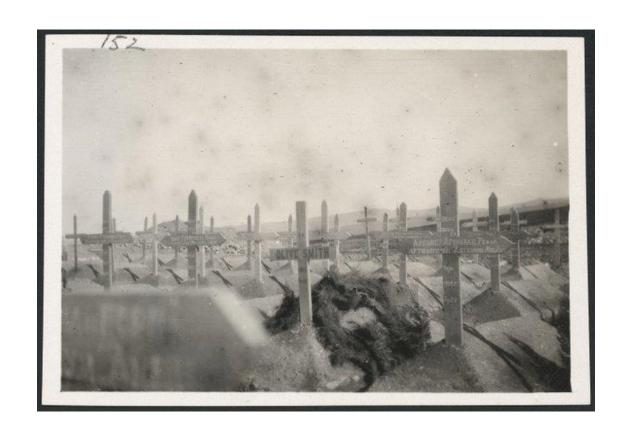
APPROVE MALBULANT TURNSTEE

Field-hospital Salonika



Arrival at Vranja

'...operating room was a ghastly sight, the floor swimming in blood, and pails crammed with arms and legs black with flies lay around the old deal table on which they had been amputated....'



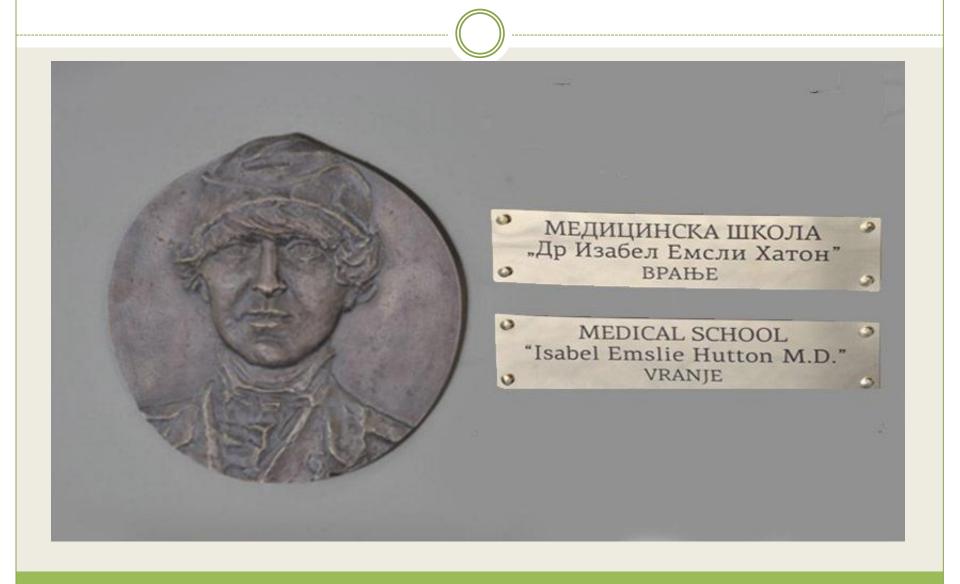
Edith Stoney

(physicist retrained as radiologist)

'could carry heavy loads of equipment, repair electric wires sitting astride ridge-tents in a howling gale, and work tirelessly on an almost starvation diet'







3. SCIENTIFIC LEADERS





Helen Gwynne-Vaughan

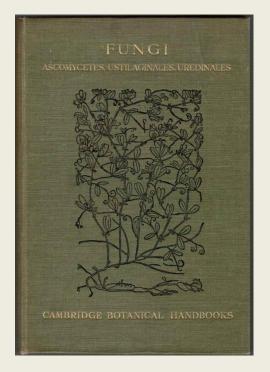




Helen Gwynne-Vaughan



I crossed the Channel... 'into a new and different world...'



Women in Uniform



Helen Gwynne-Vaughan



1879: Helen Fraser born

1909: Head of Department of Botany, Birkbeck College

1917: First Controller of the Women's Auxiliary Army Corps

1918: First woman to win a military CBE

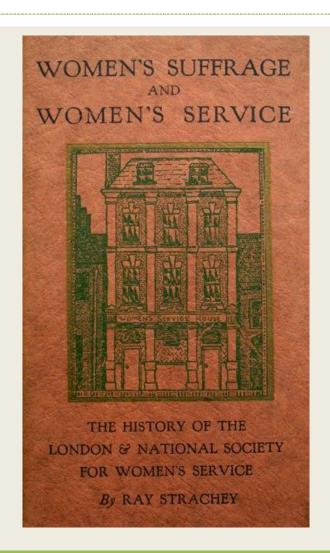
1918-19: Commandant of the Women's Royal Air Force

1921: Professor at Birkbeck (fungi genetics)

Ray (Costelleo) Strachey







Women & mathematics at Cambridge

'grind, grind, grind for six to eight hours a day at mathematics, and nothing but mathematics...Outside mathematics, lawn-tennis, eating, sleeping, cycling, and walking, I'm a more ignorant barbarian than any woman could possibly be who hadn't gone in for the tripos.'

George Bernard Shaw

Mrs Warren's Profession

1910 20% of Cambridge maths students are women

Girton Review 1902

Karl Pearson advertises for women to join his statistical team at UCL:

"...of scientific tastes, leaving College for a life of comparative leisure at home...anxious to do some work which is useful and yet which need not necessarily involve hard or long-sustained brain work."

Ray (Costelloe) Strachey

'It's like a fairyland...it gives me a queer feeling of insignificance...it is just the great solid & infinite Truth standing calmly still to be realized. It is not affected by my mood & powers, and continues sublimely on, self sufficient. I wonder no one has made a god of Mathematics.'

'the more Mathematics I learn, the more I wonder that anyone can call them dull or useless. They seem to me to be the most exciting & beautiful ideas, exquisitely expressed'

Diary

Letter to her aunt, 1904

Cricket and Suffrage at Newnham



'we have started a society which has now got more than 3/4 of the college, & which has joined with Girton & amalgamated to the national Society... Cambridge has become a centre of activity meetings, debates, plays, petitions etc all through the term'

Letter to aunt of 1907

Ray (Costelloe) Strachey

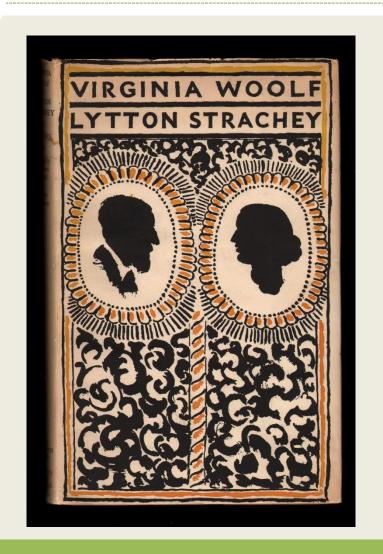
'I have decided I must go to London next winter for my engineering...The various people I have seen all advise it. I saw Mrs Ayrton, who is, as you know, a shining light in the world of electrical arc lamps, and she was most encouraging, & gave me a letter to the head of the Technical College, & he was also most kind.'

Letter to aunt

The Bloomsbury Set

Rachel Costelloe married Lytton Strachey's brother

Karin Costelloe married Virginia Woolf's brother



The Bloomsbury Set



'floppy, fat, untidy, clumsy, and making fewer concessions than ever to brilliancy, charm, politeness, wit, art, manners, literature and so forth.'

Ray on Virginia's friends

'a queer self-absorbed, fantastic set of people...They don't seem to do very much...'

War Work for Women





Ray (Costelloe) Strachey

'I find this sort of work almost too fascinating...Pippa [Strachey] and I have wound ourselves into the very thick of the intrigues, and we found ourselves dictating the leading article of The Times one day and sitting up until 4 a.m. preparing draft schemes for Mr Neville Chamberlain the next...I am packed so tight with interviews that I can hardly breathe, and find myself panting from one Cabinet Minister at dinner time only to breakfast with another the next day.'

Strachey to her mother, 1917

transport



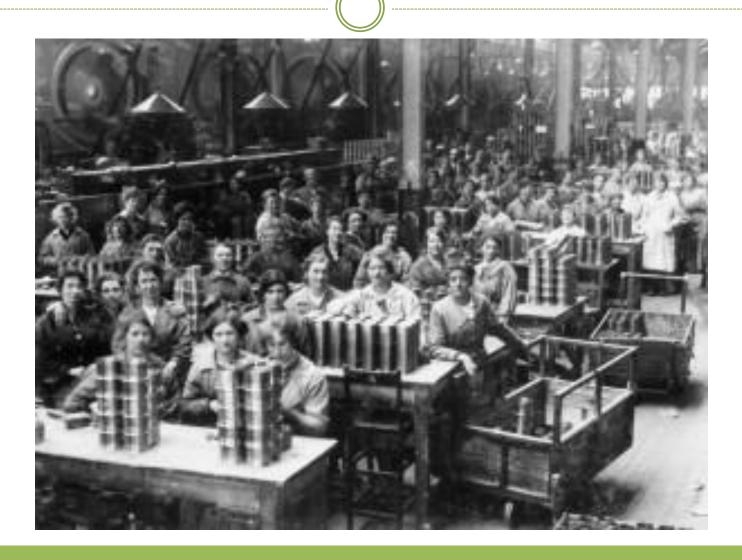
engineering



medical supplies



munitions



Repetitive work

Gretna



Dangerous work

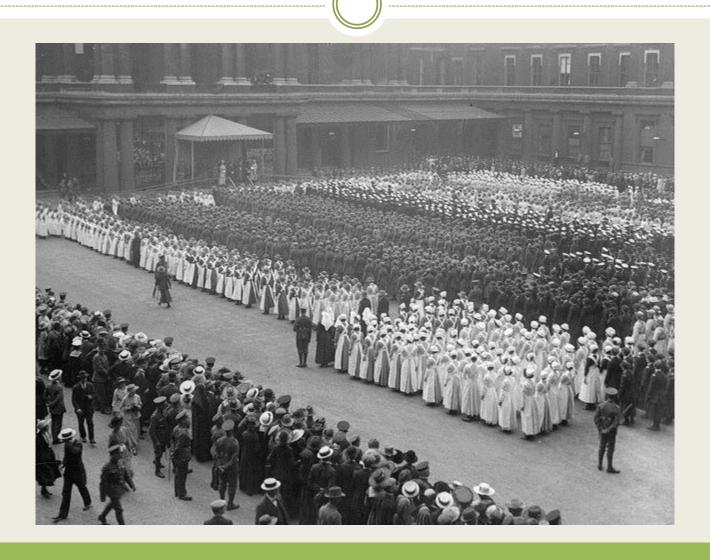
Canaries



Unequal pay



4. POST-WAR REACTIONS



Second-class Citizens

'the battle we had thought won is going badly against us – we are retreating where once we advanced; in the eyes of certain modern statesmen women are not personalities – they are reproductive faculty personified. Which means that they are back at secondary existence, counting only as "normal" as wives and mothers of sons.'

Cicely Hamilton, *Life errant* (1935)





During After



"...a large part of the female population of the country have had the time of their lives...swaggering about in every kind of uniform...[they must return to being]...wives and mothers now the men are coming home.' The Saturday Review (1919)

During After



'On the signing of the Armistice most of the women were replaced by returning soldiers...'

Sheffield steel company

During After



'I knew that it would have been unwise and unprofitable to make surgery my life's work at Home.'

Isabel Hutton

Deskilling

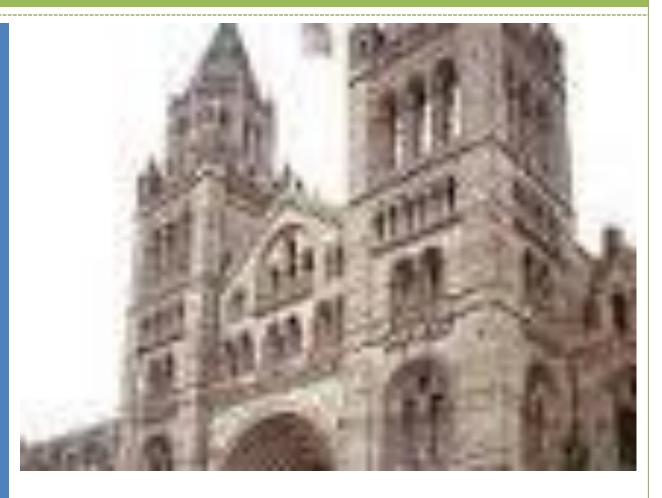


As one process after another came to be regarded as 'women's work' it became, simultaneously, 'unskilled,' and the assumption that women must inevitably be routine workers, deserving of only a 'woman's wage', remained unshaken.

Ray Strachey, *Our freedom and its results*, 1936

Dorothea Bate: 37 years classed as a temporary unofficial scientific worker

1928: women permitted to apply for permanent jobs – at low salaries



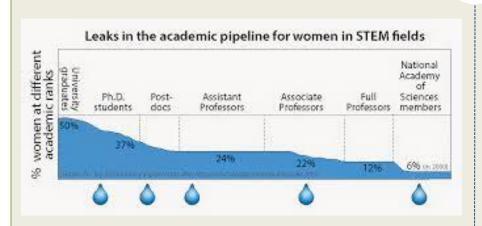
Natural History Museum

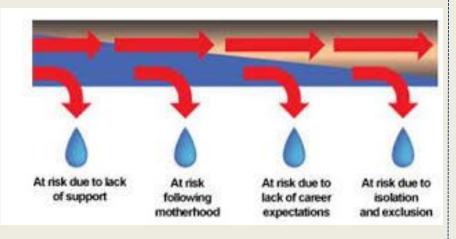
Inter-War period

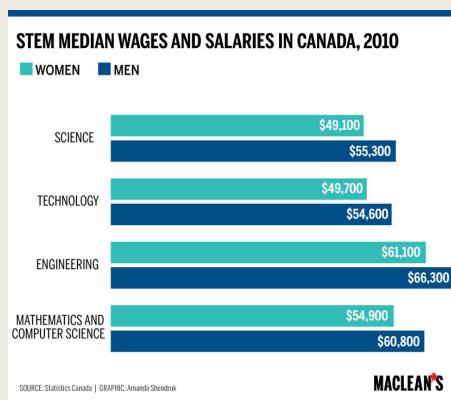
'...the male graduate...is paid a reasonable salary and, however young, if his university qualifications are good, he is usually given quite a dignified position from the beginning. The girl who worked side by side with him at the university is hard up and constantly humiliated...She will be happier if she is not too enterprising because then her sense of frustration will be less.'

Kathleen Culhame (chemist)

Women in Science: 21st century





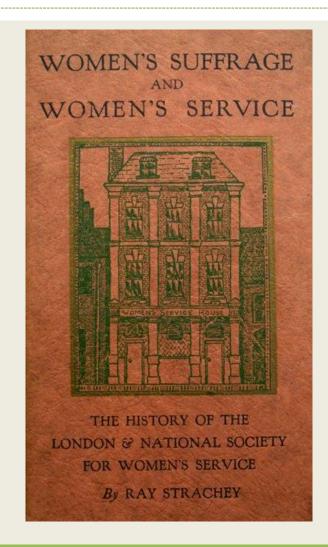


Athena Swan



Ray Strachey

'The establishment of equality of pay and opportunity for women may lie far ahead in the future; but that it does lie there is beyond question. The day of economic emancipation will come, just as the day of political emancipation came'



1927