

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)

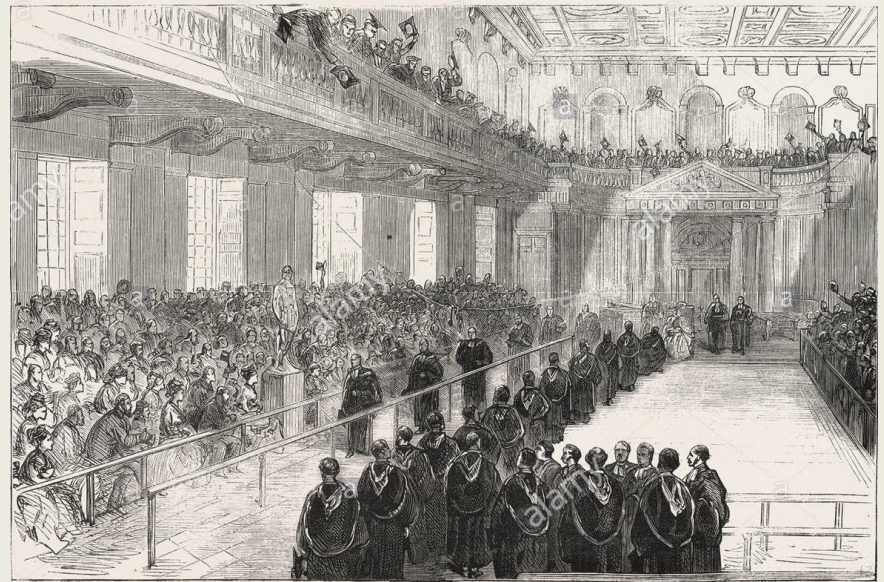


The Woman of the Future! She'll
be deeply read, that's certain,
With all the education gained at
Newnham or at Girton;
She'll puzzle men in Algebra with
horrible quadratics,
Dynamics and the mysteries of
higher mathematics.



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*

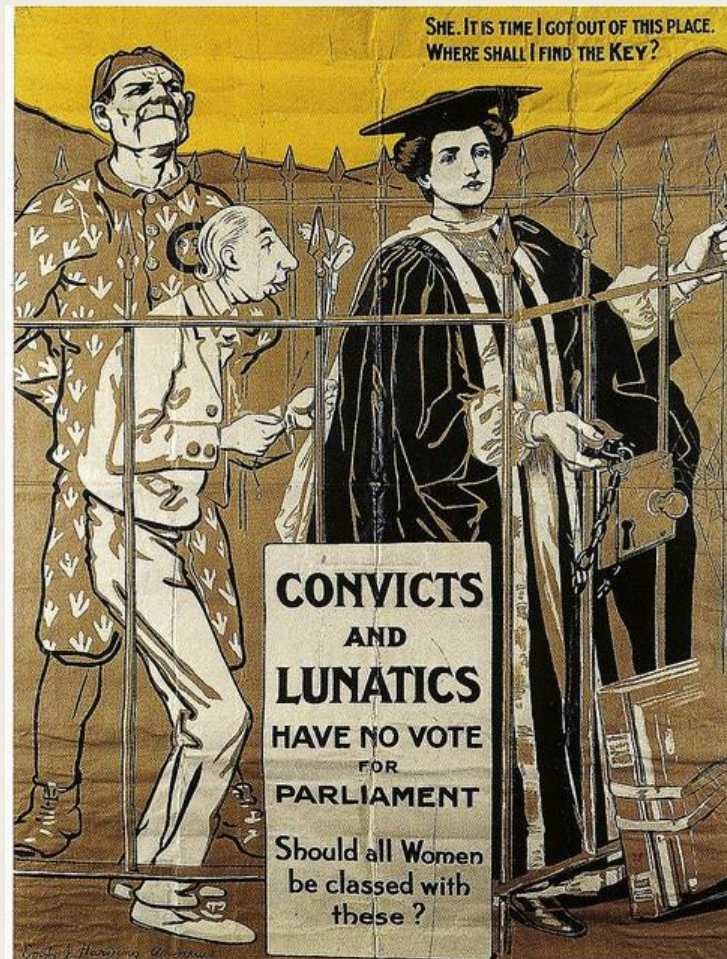
*And the other
Mathematics*

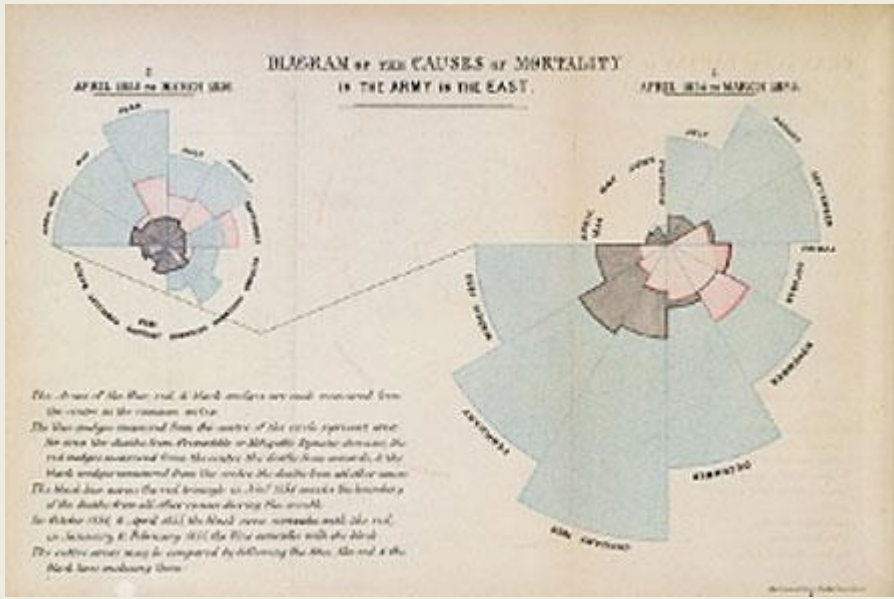
*Wreathe her brow with
bay.*





Suffrage banner

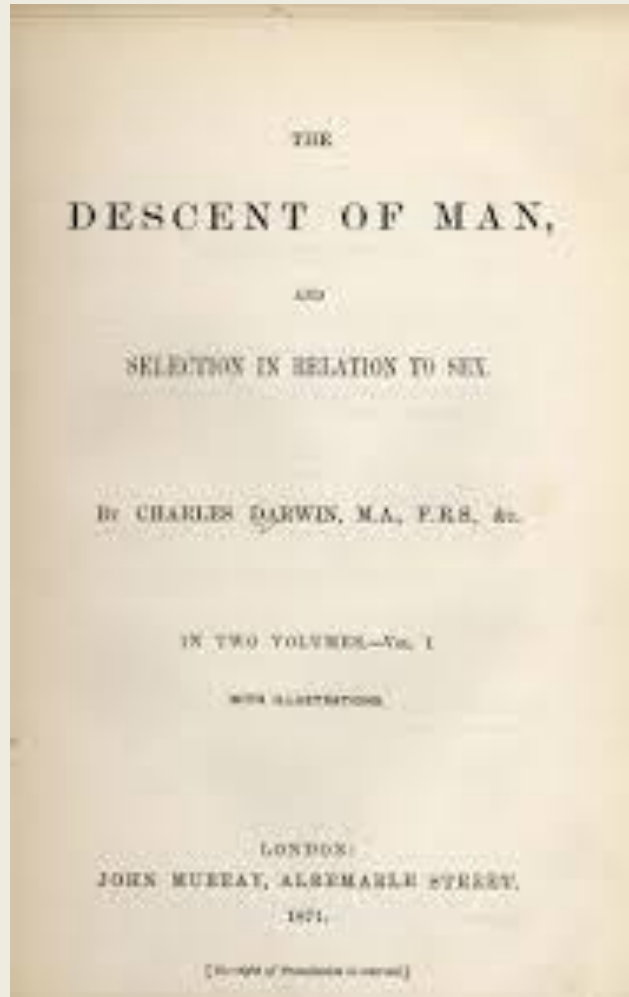




Suffragists embrace technology



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.

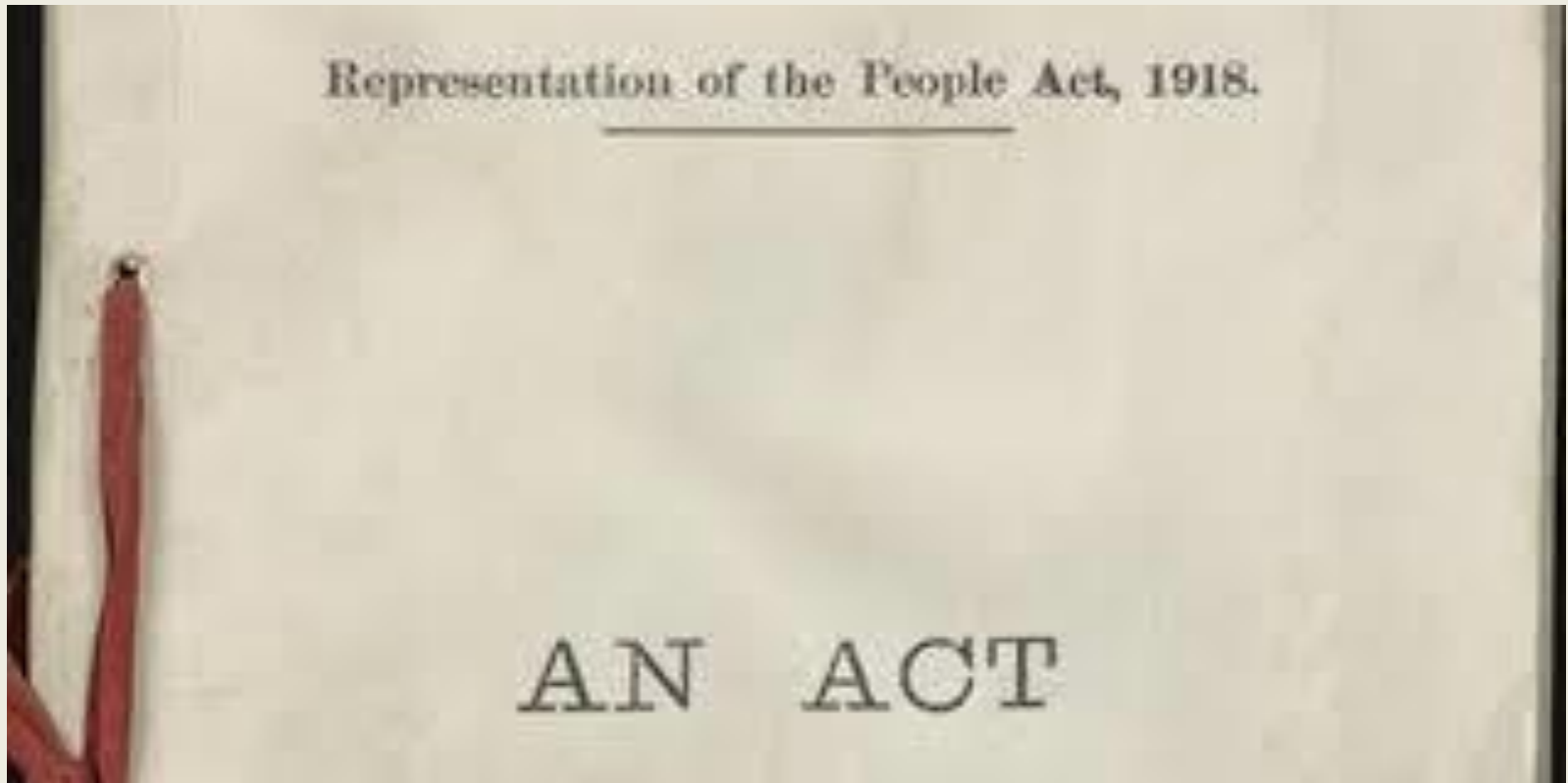
Suffrage & War



‘...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



CHEMICAL SOCIETY.
CERTIFICATE OF A CANDIDATE FOR ELECTION.

The attention of the candidate in whose favour this certificate is made out is specially directed to the fact that, if elected, he will be required to sign the following obligation prior to his admission into the Society.—

OBLIGATION—I, the undersigned, do hereby engage that I will endeavour to promote the interests and welfare of the Chemical Society, that I will observe its laws, and to the utmost of my power maintain its dignity, as long as I shall continue a Fellow thereof.

Name in full *Martha Annie Whiteley*
 Usual Place of Residence *111 Castleman, Barnes SW 13*
 Designation or Occupation *Lecturer on Organic Chemistry,*
Imperial College of Science & Technology.
M.A., D.Sc.(hon.), Author of many papers in the
Transactions & Proceedings of the Chemical Society, and
of numerous articles in Thesauri Dictionaire.
During the war divided the lab of workers in the Dept!
College Laboratory in the manufacture of synthetic drugs etc.
 being desirous of admission into the CHEMICAL SOCIETY, on the undersigned, propose and recommend him as a proper person to become a FELLOW thereof.

Dated this _____ day of _____ 192__

From Personal Knowledge: <i>William A. Riden</i> <i>J. E. Thorpe</i> <i>Mrs. Foster</i> <i>W. P. Wynne</i> <i>J. E. Morgan</i> <i>Chapman Jones</i>	From General Knowledge: <i>James C. Kilip</i> <i>H. B. Baker</i> <i>W. G. Perkins</i>
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Proposed on 28th 1922

To be Balloted for on 28th 1922

Elected 28th 1922 192__

President 7712

* Directions for filling up the Certificate are given on the other side.

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



*1st Eastern General Hospital, U.
Cambridge*

*Copyright Photograph
by J. Palmer Clarke
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

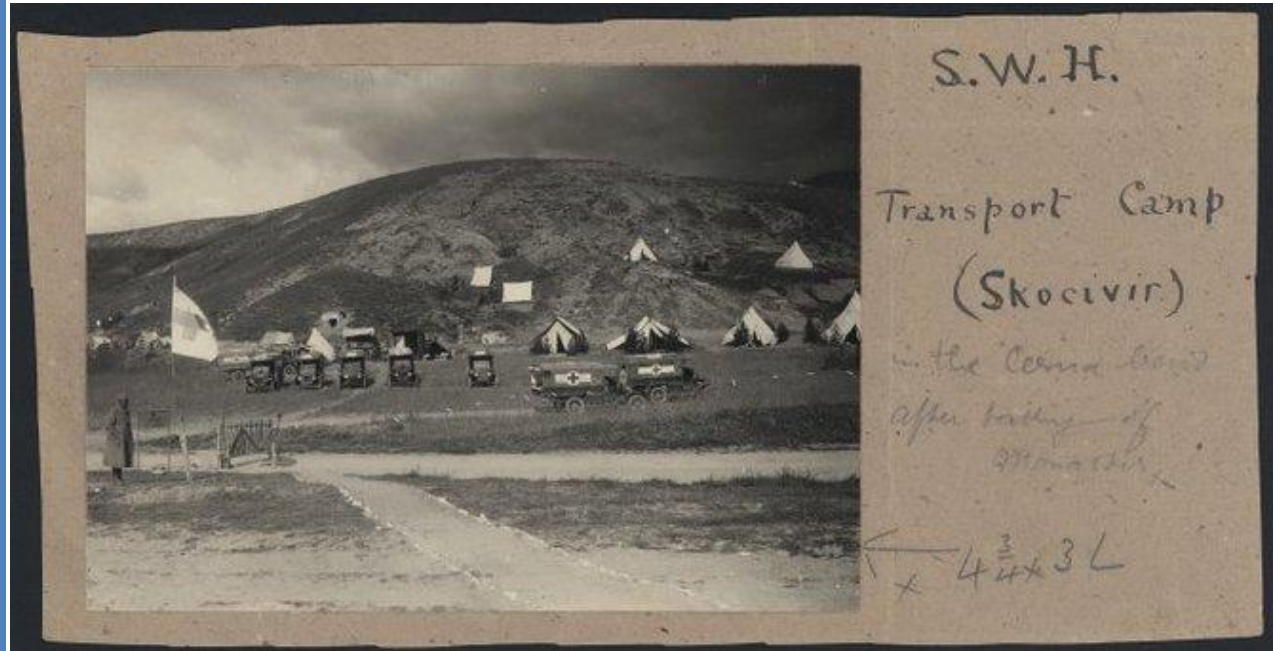
Cistercian Abbey at
Royaumont



Serbia

Scottish Women's
Hospitals

Transport camp with
ambulances and tents





MEMOIRS OF A
DOCTOR IN WAR AND PEACE

BY
ISABEL HUTTON, C.B.E., M.D.



HELMUTH

LONDON BELGIUM TORONTO



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’





МЕДИЦИНСКА ШКОЛА
„Др Изабел Емсли Хатон”
ВРАЊЕ

MEDICAL SCHOOL
“Isabel Emslie Hutton M.D.”
VRANJE

3. SCIENTIFIC LEADERS



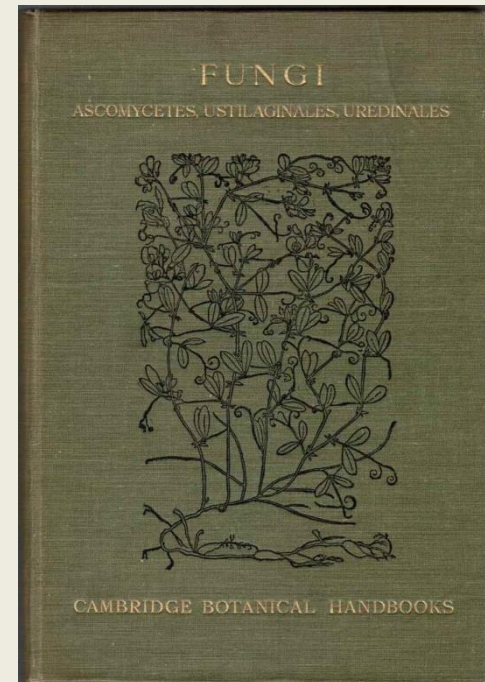
Helen Gwynne-Vaughan



Helen Gwynne-Vaughan



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



Women in Uniform



OUR AMAZON CORPS "STANDING EASY."

Helen Gwynne-Vaughan



1879: Helen Fraser born

1909: Head of Department of Botany,
Birkbeck College

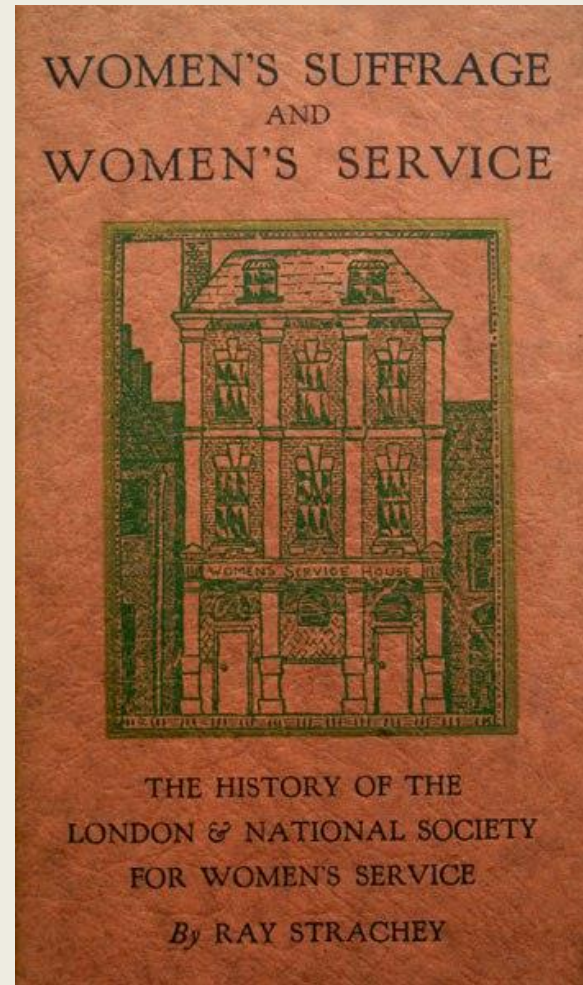
1917: First Controller of the Women's
Auxiliary Army Corps

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.’

Diary

‘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’

Letter to her aunt, 1904

Cricket and Suffrage at Newnham



‘we have started a society which has now got more than $\frac{3}{4}$ 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.’

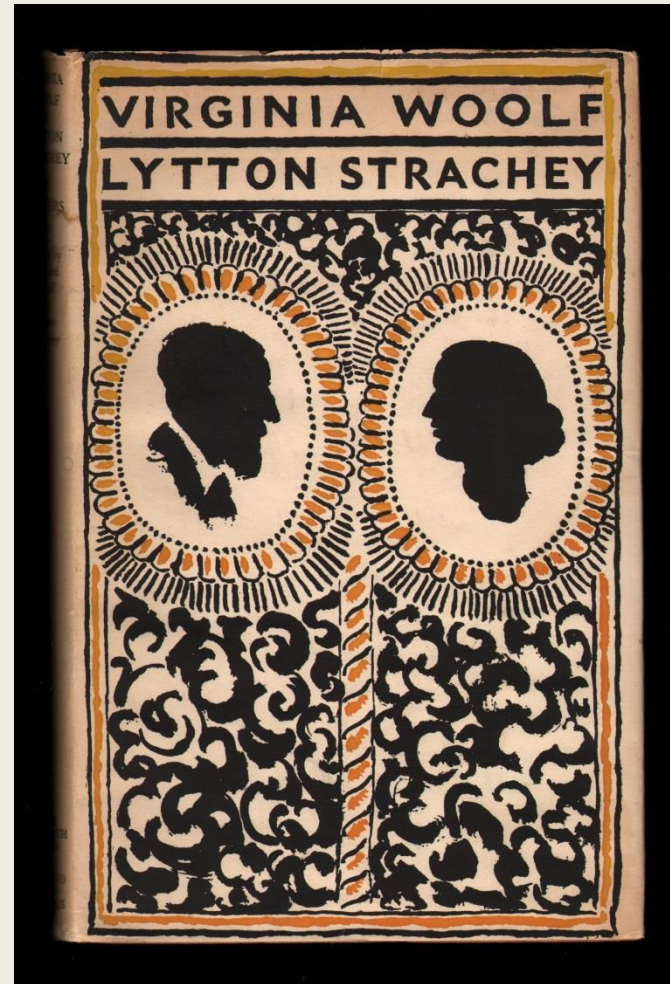
Letter to aunt

The Bloomsbury Set



Rachel Costelloe married
Lytton Strachey's brother

Karin Costelloe married
Virginia Woolf's brother



The Bloomsbury Set



Virginia on Ray

‘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...’

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



© Getty Images

munitions





Repetitive work

Gretna





Dangerous work

Canaries



Unequal pay



4. POST-WAR REACTIONS



Second-class Citizens

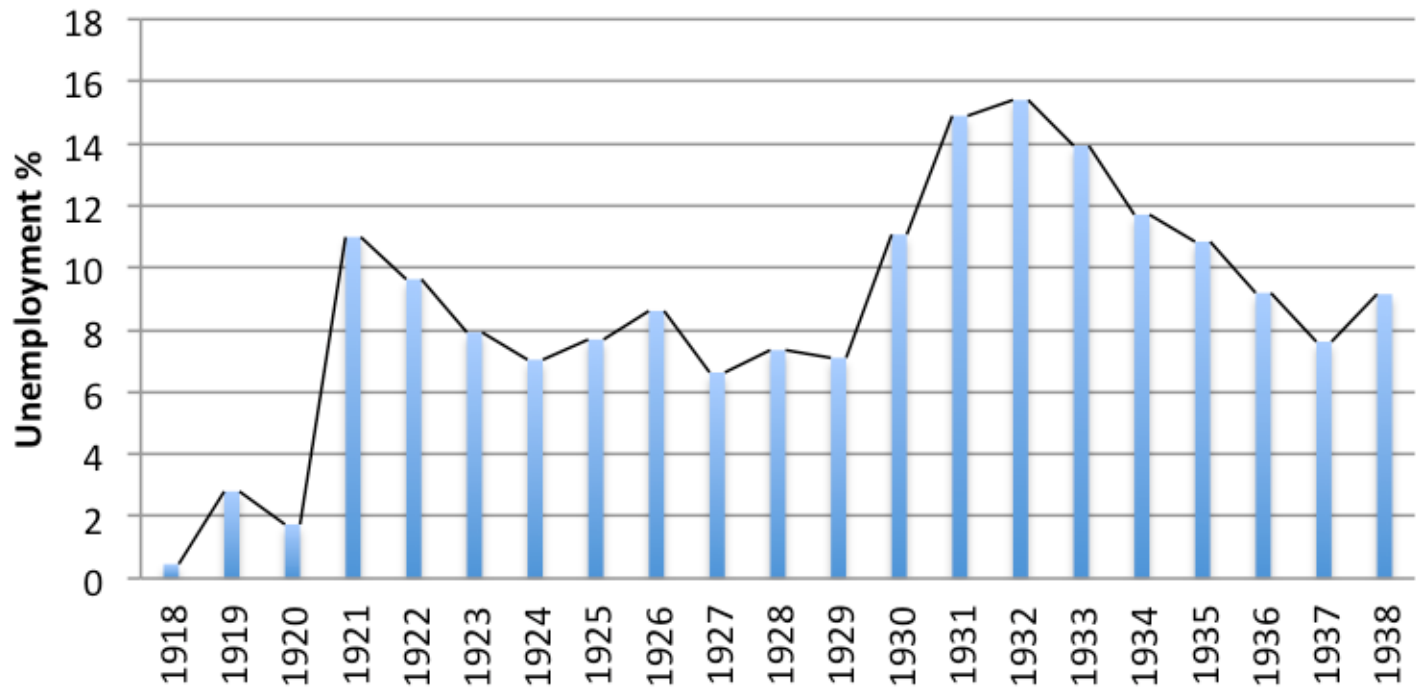


‘the battle we had thought won is going badly against us – we are retreating where once we advanced; in the eyes of certain modern statesmen women are not personalities – they are reproductive faculty personified. Which means that they are back at secondary existence, counting only as “normal” as wives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

Cicely Hamilton, *Life errant* (1935)



UK Unemployment 1920s



www.economicshelp.org | Source: IMF

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

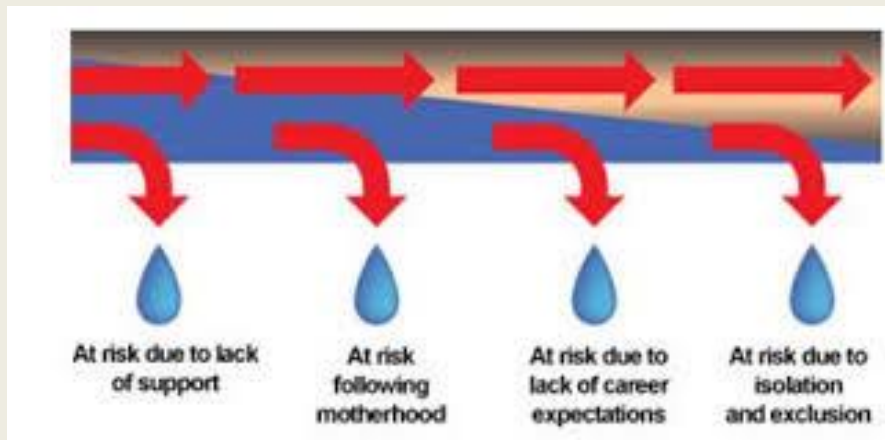
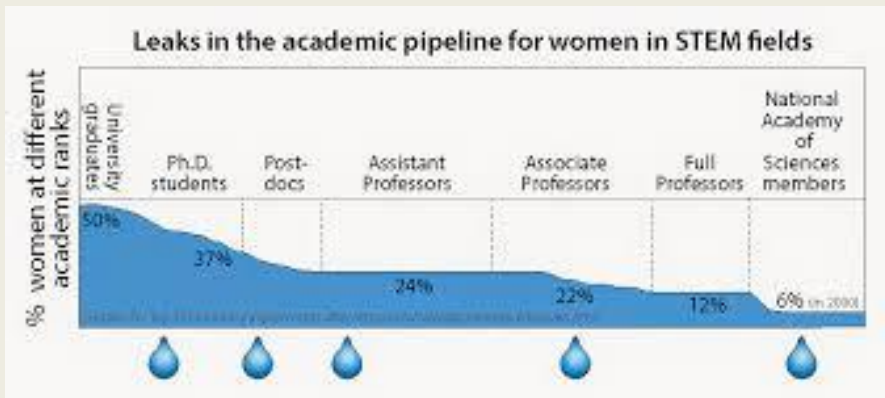
Inter-War period



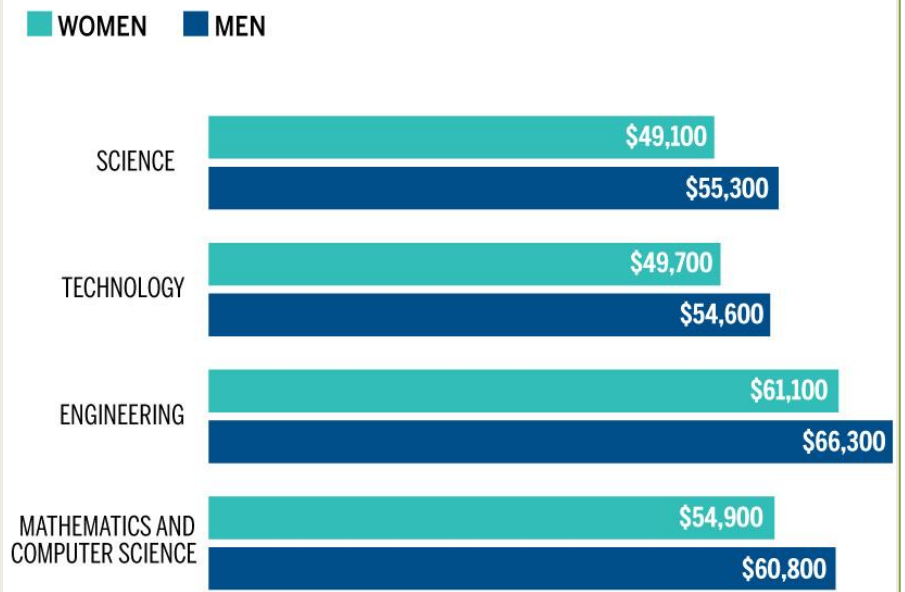
‘...the male graduate...is paid a reasonable salary and, however young, if his university qualifications are good, he is usually given quite a dignified position from the beginning. The girl who worked side by side with him at the university is hard up and constantly humiliated...She will be happier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

Kathleen Culhame (chemist)

Women in Science: 21st century



STEM MEDIAN WAGES AND SALARIES IN CANADA, 2010



SOURCE: Statistics Canada | GRAPHIC: Amanda Shendruk



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

