

PHILIPPA FAWCETT
and the
MATHEMATICAL TRIPOS



Stephen Siklos

May Term. 1890.

This year Sidgwick Hall won all the College Tennis Cups & the Fives Cup, but unfortunately our champions did not succeed in winning the Gorton Match.

June 7th. 1890.

The great event of the year was Philippa Garrett Fawcett's achievement in the Mathematical Tripos. For the first time a woman has been placed above the Senior Wrangler. The excitement in the Senate House when the lists were read was unparalleled. The deafening cheers of the throng of undergraduates redoubled as Miss Fawcett left the Senate House by the side of the Principal. On her arrival at the College she was enthusiastically greeted by a crowd of her fellow-students, & carried in triumph into Clough Hall. Flowers, letters, & telegrams poured in upon her throughout the day. The College was profusely decorated with flags. In the evening the whole college dined in Clough Hall. After dinner toasts were proposed; the healths drunk were those of the Principal, Miss Fawcett, her "Goat" (Mr. Holson) B.A., Fawcett, & the other women Wranglers, & Senior & Junior Optimes. At 9.30. p.m. the College gardens were illuminated, & a bonfire was lighted on the hockey-ground, round which Miss Fawcett was three times carried.

Sikhs

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The news on Saturday made me very happy. You will know that I care for it mainly for the sake of women; but of course I also feel especially blessed in the fact that the thing I care most of all for has been helped on in this way by my own dear child.

*Letter from Dame Millicent Fawcett
to James Thurfield, 13th June 1890
on the occasion of her daughter being
placed 'Above the Senior Wrangler'.*

Preface

In 1890, Philippa Garrett Fawcett scored the highest mark of all the candidates for the Mathematical Tripos. She was placed 'above the Senior Wrangler' because women were not eligible for Cambridge degrees and therefore could not be classed as Wranglers.

Today, since the higher levels of mathematics are still largely dominated by men, this would have seemed an impressive and noteworthy achievement. At the time, it was regarded as astonishing, spectacular and deeply significant. All the national newspapers carried suitably admiring headlines and the wider issues were discussed in editorial columns in England and abroad. For Philippa, it was a triumph.

To mark the centenary, I have tried to set Philippa Fawcett's achievement in its social and academic context. The text grew out of a talk I gave to the Cambridge branch of the Mathematical Association, which goes some way towards explaining the choice of content and style. I have concentrated on those aspects which contributed towards, and arose from, her success at Cambridge. I have also included a section on the history of the Mathematical Tripos, to explain the magnitude of her achievement, and a section on higher education for women to explain its significance. In the final section, I have summarised the careers of three Senior Wranglers: Philippa (the 'Lady Senior Wrangler'); Geoffrey Bennett, above whom she came; and her cousin Philip Cowell. It seemed to me that these lives illustrate the very different opportunities available to men and women at that time.

I have had an enormous amount of help in preparing this booklet. I could not have even started without the material and advice provided by Ann Phillips. I was extremely fortunate to receive from Betty Vernon an unpublished essay about Philippa Fawcett, which she wrote some forty years ago, containing much valuable information. Also, Sheila Browne, David Dughan, Jean Gooder, Bertha Jeffreys, Elizabeth Leedham-Green, Gill Sutherland and John Tyzack have between them supplied the ideas, support, encouragement and technical assistance necessary for a mathematician to complete a project with historical and literary pretensions, involving (almost) no formulae.

Stephen Siklos
Newnham College, June 1990

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§1 Henry Fawcett (1833 - 1884)

If you walk along the Thames Embankment from Waterloo Bridge to Hungerford Bridge, you find on your left the Victoria Embankment Gardens. These gardens are built on land reclaimed from the Thames just over 100 years ago, and are studded with monuments. Among those commemorated are W.S. Gilbert and Sir Arthur Sullivan, William Tyndale and the poet Robert Burns. There is also a rather elegant camel, which is a memorial to the role played by Imperial Camel Corps in the Great War. Close to the camel is a drinking fountain designed by Basil Champneys and on the side of this fountain is a bronze medallion showing the head of Henry Fawcett, who was, among other things, Gladstone's blind Postmaster General and father of Philippa Garrett Fawcett. According to Fawcett's biographer Leslie Stephen,¹ the fountain commemorates in particular his services to the rights of women.

Henry Fawcett was born in Salisbury in 1833. His early education was local, but he was sent to King's College School, London at the age of sixteen. Later, he studied classics and mathematics at King's College. His family ran a drapery business and although his father later became mayor of Salisbury, this social background meant that Cambridge was far from an automatic

¹ Leslie Stephen was the creator of the Dictionary of National Biography and the father of Virginia Woolf. He met Henry Fawcett at Cambridge and the two men became lifelong friends.

choice for Henry (quite apart from the expense). However, after some encouragement, he applied for and was accepted by Peterhouse in 1852. His reasons for choosing Peterhouse illustrate both his ambition and his practical nature; the college statutes permitted lay Fellows and the stipend for college Fellows was above the average. However, he discovered after a year that the competition for fellowships was stiff at Peterhouse, so he prudently migrated to Trinity Hall which was at that time in the doldrums, having recently 'concentrated too much on students of law'.²

In 1856, he sat the examination for Part I of the Mathematical Tripos and came in seventh place. It is not recorded whether or not this was considered a 'good year'. Perhaps not: the Senior Wrangler and the third Wrangler both forsook mathematics; the former became Chaplain at Ely cathedral (and died at the age of thirty three), and the latter achieved the rank of superintendent of the Calcutta botanical gardens. (The second wrangler, John Rigby, also gave up mathematics, but had a very distinguished legal career, becoming Attorney General in 1894.) In any case, seventh was an excellent result, though Fawcett was in fact expected to come even higher. Leslie Stephen's explanation for his friend's failure to fulfil expectations was that he became so excited by the contest that he lost an entire night's sleep pacing around the College courts, and thereafter fell behind. Dr Besant, one of the moderators for 1856, claimed that Fawcett

had no *special* aptitude for mathematics and that his technical and manipulative skills were not of the highest rank. He often argued in plain English when others would use mathematics and his success was based on 'sheer mental force'.[LS]

Unlikely though this may seem, it is consistent with his sudden change of direction after his Tripos year to politics and economics, and consistent with the suspicion that his main reason

² According to Leslie Stephen [LS]. Law was not at that time a Tripos subject, so Law students were not considered to be of the highest intellectual calibre.

for studying mathematics was to obtain a college fellowship,³ which was duly awarded; at Christmas of 1856 he became a Fellow of Trinity Hall.

Two years later came what for most people with political and academic aspirations would have been a complete catastrophe; Fawcett was blinded by his father in a shooting accident. Mr Fawcett suffered from cataracts and his vision was very poor. When out shooting with his son near Salisbury, he fired at the moving target, a bird, not realising that his son was standing in the line of fire. Henry Fawcett was hit once in each eye and several times in the body. Fortunately, he was wearing a heavy winter coat and thick glasses (he already had problems with his eyesight), otherwise the damage might have been much more serious.⁴

Despite this tremendous handicap, Henry Fawcett was elected to the Cambridge chair of Political Economy in 1863 at the age of thirty, and was elected Member of Parliament for Brighton at thirty two. (He later lost his Brighton seat and represented Hackney.) The Professorship required an annual residence in Cambridge of eighteen weeks, and it is a testament to his extraordinary energy that he managed to combine these two demanding positions for the remainder of his life, with dedication and enthusiasm.

The culmination of his political career came in 1880 when he was made Postmaster General in Gladstone's Liberal government. He introduced the parcel post, cheap sixpenny telegrams and savings stamps. Throughout the country, he was an enormously popular figure because of his passionate support for liberal causes (which were not always Liberal causes). He was much influenced in his political development by his close friend

³ Nevertheless, he held a high regard for the mathematical education for the rest of his life; a Senior Wrangler he would urge [LS], might be entirely ignorant of the law, but three years after his degree he would be a far better lawyer than the man who had been crammed with legal knowledge for three years in place of being trained in the use of his logical faculties.

⁴ An example of Lamarckian evolution: Mr Fawcett passed on to his son the poor eyesight acquired during his lifetime.

John Stuart Mill, who remains his companion on the Victoria embankment.

He was elected a Fellow of the Royal Society in 1882 but in the same year he suffered from a severe bout of diphtheria and typhoid fever. Despite an apparent complete recovery, his health, up till then very robust, had been seriously weakened, and he died two years later.

Henry Fawcett was a big man; 6' 3" tall and with stature to match. Leslie Stephen reports that 'his skull was very large; my own head vanished as if into a cavern if I accidentally put on his hat'. Throughout his life he insisted that no allowance should be made for his blindness and he apparently made none himself. 'It took me one night', he wrote, 'to decide whether the loss of my sight should make any difference to my life. I decided it should not.'⁵ He liked to greet his friends with a hearty 'You are looking well', which was generally found a little unnerving. Before his accident, he had played all sorts of sports which now became impossible. Nevertheless, he remained devoted to outdoor exercise. In fact, his main weakness in Leslie Stephen's eyes was to measure a man's moral excellence by his love of walking. He himself loved walking and climbing; on the Downs near Brighton, in the Lake District, and once in the Alps to 'enjoy the snow-covered panorama'. To the very end of his life he liked to go for a gallop on Newmarket Heath.

He was also a powerful skater, thinking nothing of skating upwards of sixty miles in one day. He often used to insist that his whole establishment, family, secretary and two maids, enjoy these pleasures with him (the two elderly cooks were excused). Sometimes his daughter would skate ahead, whistling so that he could follow. On other occasions it was his gyp (i.e. his college servant) who guided him. His friend G.F. Browne⁶ recalls

⁵ His father said that he would find his own part in the tragedy less hard to bear if only his son would complain a little.

⁶ George Forrest Browne was, among many other things (including founding editor of the *University Reporter*, Disney Professor of Art and Archaeology and Bishop of Bristol), secretary of the Cambridge Local Examination Syndicate. One of his first tasks was to

a particular expedition [GB]:

My last skate from Cambridge to Ely was with him, a much longer way by ice than by road. He went very fast, those immensely long arms going like the sails of a windmill. His gyp at Trinity Hall was a first rate skater, and he went in front of Fawcett, holding a stick behind him, the other end of which was in Fawcett's hand. At one point of our voyage, Fawcett's skate caught in a piece of cat-ice which the gyp had not seen, and he came down with a tremendous crash, hat, stick, spectacles, body, limbs, all going in different ways. The look on his face for the first moment or two was terrible; one could realise the sense of not knowing what would happen. Then he called out 'Anybody damaged?' and we went on as usual. I had to get back to Cambridge by train, but he just turned round and skated back.

In 1866 Henry Fawcett resigned his fellowship at Trinity Hall and was immediately re-elected under new statutes. One effect of these statutes, which he had played a principal part in obtaining, was to abolish the restriction of celibacy. The next year, he married Millicent Garrett. In the assessment of Leslie Stephen, 'his wife was entirely in sympathy with his principles, shared his intellectual and political labours, and was the main source of most of the happiness and success of his later life'.

§2 Millicent Garrett Fawcett (1847 - 1929)

Millicent Garrett was the fifth daughter and eighth child of Newson Garrett, a radical merchant and shipowner from Aldeburgh. He was also very much part of the local seafaring community, and in her autobiography, 'What I remember'[MF], Millicent recalls some of her earliest memories of her father at the end of the rescue line bringing in shipwrecked sailors.

In the middle of the nineteenth century, Newson Garrett's ships ferried cargoes up the River Alde from London and the North and his business flourished. However, with increasing competition from the railway network, he decided to diversify.

Accordingly, he built a malting house a few miles up the river at Snape, where he lived during the winter months when the malting took place, and used his fleet to carry grain and other raw materials.

Newson Garrett was proud of his family, with some justification. His daughter Elizabeth (later Garrett Anderson) was as distinguished in the field of medicine as Millicent was in the Women's Suffrage movement. She became Britain's first women physician, was elected to the first London School Board, was the first woman member of the BMA and the first woman dean of a medical school, and, at the age of seventy one, Britain's first woman mayor (of Aldeburgh). Not just one but two of Newson's grandchildren came top of the Mathematical Tripos; his daughter Alice's son, Philip Cowell of Trinity, was Senior Wrangler in 1892.

Millicent was younger by eleven years than Elizabeth.⁷ Like her sister, she attended and enjoyed for some years Miss Brown-ing's⁸ school in Blackheath. However, to her bitter disappointment, her father was obliged to withdraw her from school at the age of fifteen, after which she continued her education as best she could at home. The cause of this misfortune seems to be Newson Garrett's rivalry with his brother Richard. Goaded by Richard's success (he ran a thriving agricultural machinery workshop at nearby Leiston, which had its own railway branch-line), Newson decided to double the size of his maltings. With apparently characteristic impulsiveness [JM], he sketched the outline of the new walls on the ground with his walking stick and told the architects to start building immediately. The results of this haste were the temporary financial discomfort which resulted in Millicent's removal from school and an impressive new building with crooked walls, which, until the recent fire, could be seen as part

⁷ It was through Elizabeth that she came to know Emily Davies, who later founded Girton College at the same time as Millicent was instrumental in the establishment of Newnham. Emily Davies regarded Elizabeth as her protégée, providing not only inspiration and staunch support, but also practical advice in planning her battles.

⁸ An aunt of the poet.

of the concert hall. The new maltings had its own branch-line.

After leaving school, Millicent found plenty to amuse her in Aldeburgh. She spent the mornings reading and studying, but also enjoyed riding, skating, boating and dancing. From time to time, she went to stay with her sister in London, where she visited the theatre, the opera and political events such as J.S. Mill's election meetings.⁹ Most of all, she loved music. She attended concerts regularly throughout her life, and often travelled long distances for special musical occasions.

In 1865, she met Henry Fawcett at a party given by a Member of Parliament. He was already a Cambridge professor and publicly acclaimed as the blind Member for Brighton. She was seventeen, but was apparently more than willing to join in the conversation and voice her opinions to the assembled politicians and their friends. Henry Fawcett was much impressed, and after some manoeuvring, he was invited by Newson Garrett to spend a few days at Aldeburgh. He and Millicent were married the following year.

Much of Millicent Fawcett's time was taken up with her husband's work – reading his papers to him, writing down his speeches and accompanying him on his campaigns. However, she achieved a reputation of her own with her booklet 'Political Economy for Beginners' which reached a wide readership. She also found time to take part in the first women's suffrage committee and her efforts in this direction found strong support from her husband. In 1868, she also found time to give birth to her only child, Philippa, an event which does not feature in her autobiography [MF].

She was, she said, a 'Women's suffragist from the cradle' (perhaps referring to the effect of her older sister's struggle against prejudice and slight) and her convictions strengthened with time and experience. When she was about thirty, a young pick-pocket was caught stealing her purse on Waterloo station.

⁹ Later, she gave the first money she ever earned, £7 for an article on 'The Lectures for Women at Cambridge', to Mill's second election campaign.

When in court I saw the charge sheet and noted that the thief was charged with 'stealing from the person of Millicent Fawcett a purse containing £1 18s. 6d, *the property of Henry Fawcett*', I felt as if I had been charged with the theft myself.¹⁰

After her husband's death, when she was 37, she threw herself into her political work and soon established herself as a leading political figure of the day. She was elected President of the National Union of Suffragist Societies in 1897. Later, she became the focus of the non-violent campaign, distancing herself from the activities of the Pankhursts and their followers. She became Dame Millicent in 1925.

One of her many interests was the Boer War, and in 1899 she lead a 'commission of ladies' to South Africa to investigate the conditions in the concentration camps. Her report, which was circulated to both Houses of Parliament caused a scandal, and great reforms resulted. On this trip, she was accompanied by her daughter, for whom it was to have far-reaching consequences.

Millicent Garrett Fawcett died in 1929, sixty one years after her first speech in the crusade for women's suffrage. Her battle for equal parliamentary representation of women had ended in victory; the battle for equal rights in education had still some way to go.

§3 Education for women

Some 400 years after the founding of Eton College, pressure began to mount for academic provision to be made for girls. There were in fact plenty of schools of the genteel seminary type where girls could acquire the social graces and skills necessary to secure a husband of suitable fortune and standing.¹¹ There were also more academic schools, such as Miss Browning's establishment in Blackheath; she particularly objected to needlework at

¹⁰ To her horror, the thief was condemned to 7 years of penal servitude.

¹¹ At Miss Pinkerton's Academy, Amelia Sedley became proficient in music, dancing, orthography and in the principles of religion and morality; she was however judged wanting in the deportment and geography departments [Vanity Fair].

her school, threatening 'a guinea a stitch' if she saw a girl with a needle in her hand [MF]. The girls of the better class families had governesses, who were usually those middle class women whose education had not achieved the desired effect of attracting a suitable husband (often because their own families had fallen on hard times). The duty of the governess was not to provide an academic education for her charges, so the fact that their own education was in most cases deficient in this respect seems not to have mattered.

Higher education was an exclusively male preserve; it was thought not only too difficult for women but also unnecessary and inappropriate. The first significant advances were made in 1848 and 1849 with the foundation of two colleges for women in London: Queen's College in Harley Street and Bedford College. These colleges were not attached in any way to the University of London, which in any case functioned more as an examining body than a University at this time. A large part of the teaching they provided was necessarily, in view of the ground to be made up, at a much lower level than that given by, for example, University College, and of course bore no comparison with the work going on at *the* Universities at that time. Nevertheless, their influence spread rapidly through a succession of pioneering students. The two most distinguished, both early pupils at Queen's, were Frances Buss, who founded the North London Collegiate School in 1850 (wasting no time at all!) and Dorothea Beale, who became the Headmistress of Cheltenham Ladies' College in 1858.

The report of the 1864 Schools Enquiry Commission provided the next milestone. This report ran to twenty volumes of evidence and included, largely at the instigation of Emily Davies, a small but crucial section on girls' education. Representations to the Commission were made by Miss Beale and Miss Buss, among many others, and in particular by Emily Davies. Official recognition was given both to the inadequacy of the current system (stated 'with the utmost confidence and agreement'), and also to the necessity for improvement. The report recommended

that girls' schools similar to the North London Collegiate should be set up in all towns with more than four thousand inhabitants. This led to the creation of a system of Endowment Schools for Girls [GS]. A parallel initiative led in 1872 to the founding of the Girls' Public Day School Company (later Trust) which was to establish, in London and the provinces, 'superior day schools at moderate cost'. The report also commended the efforts of Miss Davies to provide new examination schemes for women.

Emily Davies had been hatching her schemes for some years before the Commission's report. Her initial aim had been to persuade the examination boards of Oxford and Cambridge to open their Local Examinations to women. There was considerable opposition because, for example, if girls sat the examination and did badly, it would lower the status of the examination in the eyes of the boys; on the other hand, it would be a considerable embarrassment if girls sat the examination and did well.¹² There were also many practical difficulties; it would, for example, be out of the question for middle class boys and girls to sit the examination in the same room. In 1863, her perseverance was rewarded when the Cambridge Local Examination Syndicate agreed to a trial examination for girls. At Oxford, the Local Examination Delegacy judged that 'the University would think the examination of young ladies a matter altogether beyond its sphere of duty' [MT], so Cambridge found itself in a somewhat unfamiliar role in the vanguard of educational reform.¹³

The trial was conducted on an informal basis, so that Emily Davies had to write to all the examiners personally to persuade them to mark the extra scripts. Despite the fact that the eighty three candidates had only six weeks to prepare for the examination, the examiners found that their performance was comparable to that of the boys in all subjects except arithmetic. The

¹² Elizabeth Garrett encountered similar opposition at Middlesex Hospital Medical School; while she was an unknown quantity, she was treated with good-humoured tolerance, but when she proved to be cleverer and more hardworking than her classmates, they refused to allow her to continue. [JM]

¹³ Only in England; Scotland already admitted girls to public examinations.

following year, the University (persuaded by, amongst others, Henry Fawcett) voted to open the Local Examinations to girls for a period of three years, prudently stipulating that the names and class lists be unpublished. In 1867, the scheme was reviewed and made permanent.

Meanwhile, pressure was growing for some provision to be made for women at Oxford and Cambridge. Henry Sidgwick, the Knightbridge Professor of Moral Philosophy at Cambridge, was a guiding force. He started a series of meetings, often held in the Fawcetts' drawing room at 18 Brookside, to make plans. Philippa was aged about two at this time, old enough 'to be brought in at the tea-drinking stage at the end of the proceedings and to toddle about in her white frock and blue sash amongst the guests' [MF]. In 1871, as a result of these meetings, Miss A. J. Clough was invited to take charge of a house of residence for women in Cambridge.

Anne Jemima Clough (sister of the poet Arthur Hugh Clough) was the pioneer of a scheme of lectures for women. Her scheme involved the senior girls from every school in a town coming together for special lectures given by qualified lecturers. By 1869, it was running extremely successfully in some twenty five centres in the north of England. Henry Sidgwick's first intention was to get a similar scheme running in Cambridge, using University lecturers. Then, a year after the first lectures, he decided to make provision for non-Cambridge women to attend the lectures. Accordingly, he rented and furnished a house in Regent Street, in which he housed the first five students and Miss Clough.

Even though, in Millicent Fawcett's words, 'wishing to establish a college for women in Cambridge'¹⁴ was like wishing to establish it on Saturn', the enterprise flourished. It rapidly outgrew 74 Regent Street so Miss Clough moved her flock to Merton Hall, on the corner of Queens' Road and Northampton Street.

¹⁴ Emily Davies had established her college, which was to become Girton, two years previously, but in Hitchin.

Very soon, this also proved too small. At first, the students overflowed into 7 Trumpington Road, but in 1875 a plot of land was leased in Newnham village, a discreet distance from the main university buildings, on which, in a very short space of time, Newnham Hall (now Old Hall) with thirty students appeared.¹⁵ The buildings, like Henry Fawcett's drinking fountain, were designed by Basil Champneys.

Despite the presence of the two women's institutions in Cambridge,¹⁶ women were by no means accepted as serious students. (The good looks and fashionable dress of some of the early students – 'their unfortunate appearance', according to Henry Sidgwick – did not help.) For those students who took the Tripos examinations, permission had, at first, to be obtained each year from the examiners to use the papers, and one of the examiners in each subject had to be persuaded to mark the women's scripts. However, in 1881, ten years after the the foundation of Newnham, the University voted (the 'three graces') to allow women to be admitted to University examinations. The successful candidates were awarded a special certificate, which was in no way equivalent to a degree. Emily Davies had hoped that real degrees could be awarded, but Henry Sidgwick believed that asking for degrees would cause the whole enterprise to fail. This view prevailed, not surprisingly, since Sidgwick was on all the relevant University committees, but perhaps correctly, as there was much hostility to the idea of degrees for women:

If given the BA, they must next have the MA and that would carry with it voting and perhaps a place on the electoral role; a vote for the University Livings and all the rest. Even the BA would enable them to take 5 books at a time out of the University Library on a ticket countersigned by 'their tutor'. I¹⁷ am

¹⁵ The residence fee was £20 for a term (£15 for those intending to become teachers); fires (£4) and wine were extra. Everyone, including the principal, was supposed to make their own beds and help with the domestic chores.

¹⁶ Emily Davies had moved her students to Girton in 1873.

¹⁷ W.W. Skeat to Henry Sidgwick, quoted in [MT]. Curiously, Skeat was much in favour of women's education, and was a member of the original committee which set up the Cambridge Lectures for women.

entirely opposed to the admission of women to 'privileges' of this character. And I honestly believe they are better off without them.

In fact, as far as examinations were concerned, Cambridge women had to wait a long time before they were treated on the same terms as the men. London University, after refusing to allow Elizabeth Garrett to be a candidate for examination in 1872, agreed ten years later that 'every degree, prize and honour should be accessible to both sexes on equal terms'.¹⁸ Durham followed in 1895 and Oxford men gave in gracefully in 1920. A similar pattern of events was taking place in some continental universities. In 1908, Göttingen refused to allow Emmy Noether¹⁹ the status even of *Privat Dozent* (unpaid tutor) but this decision was reversed in 1919. (It is said that the common argument 'Whatever would our young men returning from the war think of being taught by a woman?' was met by David Hilbert's 'Gentlemen, we are running a university not a bathing establishment'.)

However, it was not until May 1948 that similar Statutes at Cambridge received Royal Assent. The women graduating in that year tactfully agreed to hold back until after October, when Queen Elizabeth (now the Queen Mother) received the Degree of Doctor of Laws, thus becoming the first woman to hold a Cambridge degree.²⁰

Lectures proved less of a problem than examinations. By 1873, more than half of the Professors were prepared to admit women to their lectures. University men were not averse to trekking out to the women's colleges to give lectures and coaching. (At Girton, provision was made for the storage of lecturers'

¹⁸ But the medical schools did not become mixed until after the second world war.

¹⁹ Emmy Noether was a mathematician of considerable distinction; so good that many colleagues were prepared to overlook her unfortunate gender. Her shortage of the usual desirable feminine qualities was often remarked on and she was sometimes referred to as 'Der Noether'. She was the only woman to be included on the well known IBM 'Men of Modern Mathematics' mural.

²⁰ From 1920, women could supplicate for the right to use the title of BA, thus obtaining a titular degree.

tricycles.) Special lectures for women were still given, continuing the scheme begun by Henry Sidgwick. They were usually held in Sidgwick Hall, Newnham, and admission was by ticket, which non-Newnham students had to purchase from MacMillan and Bowes, in Trinity Street.²¹ By the mid 1890's, the lectures had largely become redundant as far as Tripos students were concerned,²² because it was accepted that women could attend any university lecture (provided suitable seating arrangements were adhered to, and, at first, with suitable chaperons).

Although the women were made welcome by many lecturers, others merely tolerated or simply ignored them. It was not uncommon for lecturers to address their mixed audience as 'Gentlemen!' despite the presence, or even, during the Great War, a preponderance, of women. One lecturer is said to have opened his lectures thus until the number of men in his audience dwindled to a just one, after which he addressed the audience as 'Sir'! Practical work in science was a problem which both women's colleges overcame by building their own laboratories.²³

In a remarkably short time Newnham and Girton students were able at least to unsettle local prejudices. Miss Agnata Ramsey of Girton (later Mrs Montagu Butler, the wife of the master of Trinity) demonstrated that perhaps the Classics were not completely beyond the powers of women by being the only student in the first class of the 1887 Classics Tripos. This occasioned the famous Punch cartoon showing a guard turning away male passengers from a first class railway carriage, the caption being 'For Ladies Only'.

However, the main proving ground had to be the Mathematical Tripos, since it was widely believed that the field of mathematics was peculiarly incompatible with female thought processes. In the first preliminary trial for the Cambridge Local

²¹ In 1890, the price was one guinea for a course of one lecture per week.

²² In mathematics, the only lectures given were on 'Arithmetic', presumably a far cry from what was required for the Tripos.

²³ The old chemistry laboratory at Newnham still stands alone in the gardens, and has recently been used as a studio for the University artist in residence.

Examination, thirty four out of the forty girls who entered the arithmetic paper failed it, and it was suggested that the standard of arithmetic should be lowered to suit the capacity of girls. Even the staunchest supporters had their doubts. In his inaugural lecture as founder of Queen's College for women, Rev. F.D. Maurice told his audience 'We are aware that our pupils are unlikely to advance far in mathematics'; and Henry Fawcett is supposed to have remarked at one of the meetings organised by Henry Sidgwick that 'he did not imagine if the Universities were opened to women that they would produce any Senior Wranglers'.²⁴ Even when it turned out that girls might be capable of tackling advanced mathematics, there were doubts about whether it was appropriate for them to acquire such skills. Miss S.A. Burstall, Headmistress of Manchester High School for Girls, put the case in her textbook on English High Schools:

In the opinion of the present writer, who it may be noted, took the Mathematical Tripos,²⁵ mathematics should be kept at a minimum for girls; it does not underlie their industries as it does so many of the activities of men – engineering, building, the art of war

Nevertheless in 1880 C.A. Scott of Girton came 8th in the Mathematical Tripos, the first woman to be placed in the first class. She later became a full professor at Bryn Mawr College, returning to Cambridge on her retirement after the first world war.

Then in June 1890 came the ultimate achievement: Philippa Fawcett headed the list in Part I of the Mathematical Tripos. There could hardly have been a more effective or more timely challenge to popular prejudices. All the national newspapers discussed the events in Cambridge and wider issues were raised in the leader columns. Bundles of letters and telegrams arrived at the Fawcetts' London home congratulating Philippa's mother.

²⁴ But this anecdote, reported in the Daily Chronicle in 1924, may well have improved with hindsight.

²⁵ And did well; she was ranked 31st, near the top of the second class of part I in 1882.

Two comparisons are of interest. Four years later, A.M.J.F. Johnson of Newnham was alone in the first division of Class I of Part II of the Mathematical Tripos²⁶ having been placed between 5th and 6th in Part I the previous year, but this seems to have passed almost unnoticed; following Philippa, and without the Fawcett connection, Miss Johnson's brilliance had no deep significance. Then there is Ruth Lawrence's recent spectacular feat of coming top of the Oxford class list at the age of fifteen. In many ways, this achievement far surpasses that of Philippa Fawcett but, although it received nationwide interest and admiration, it was in no way controversial. In the political climate of 1890, set against the background of the struggle for women's suffrage, Philippa Fawcett's achievement created much greater impact.

When the euphoria had died down, the doubts set in. Could it be that the main effect was merely to encourage the converted rather than convince the sceptics? Mrs Fawcett wryly notes [MF]

Sir Henry James²⁷ said that Philippa's achievement had considerably weakened his opposition to our claims. This however was only a passing phase of emotionalism, and he soon returned to normal.

But this was Millicent Fawcett in pessimistic mood. From that time on, those who tried to argue that women were not sufficiently rational in thought to be allowed the vote could be rapidly silenced. A blow for the Cause had been struck.

§4 The Mathematical Tripos

One might ask why it was that Henry Fawcett decided to study mathematics at Cambridge, when his interests and apparently his real talents lay elsewhere. The answer is that there was very

²⁶ Part II was much less competitive, and there were only 7 candidates in 1894.

²⁷ Henry James was Attorney General in Gladstone's government, and later Chancellor of the Duchy of Lancaster. He first attracted attention in Parliament by with his spirited opposition to Jacob Bright's 1871 bill proposing parliamentary franchise for unmarried female householders.

little choice. In order to obtain a Cambridge Honours degree, it was necessary to sit a Tripos examination.²⁸ The object of the Tripos was to turn out able and rounded men, and it was thought that the study of mathematics with a little philosophy was the best way to promote the mental agility required for gentlemen in all walks of life. Mathematics included natural philosophy (i.e. physical sciences) and astronomy, and of course knowledge of Latin was taken for granted.

Until the creation of the Classical Tripos in 1824, there was in fact only one Tripos, and that, from the late seventeenth century, was dominated by mathematics. Even after 1824, a good deal of mathematics was still required, since students could only study for the Classical Tripos after taking Part I of the Mathematical Tripos. When Henry Fawcett came up to Trinity Hall in 1852, Part I of the Classical Tripos had just been introduced, but the Mathematical Tripos was still the only respectable choice for a man of ambition. When his daughter came to Newnham in 1887, eight Tripos subjects could be studied: Mathematics, Classics, Moral Sciences, Theology, Modern Languages and History.

The Cambridge obsession with mathematics dates from the time of Newton, whose work was (rightly) revered by his contemporaries and successors. In fact, it is sometimes claimed that Newton held such a stranglehold on the subject that no mathematical or scientific advances of any significance were made in Britain from the publication of his *Principia* (1687) until the time of Babbage, Hamilton, Kelvin, Cayley and Maxwell more than one hundred and fifty years later.²⁹ It is certainly true that mathematicians in England stuck loyally to the master's treat-

²⁸ In earlier times, Honours degrees could be conferred on students of suitable social status without examination. These *Proctors' Optimes* were chosen by the vice-chancellor, proctors and moderators, and were inserted ad libitum into the class list. The process was open to abuse – for example, in 1776 four men were inserted between the Senior Wrangler (from Emmanuel) and the second Wrangler (from Jesus) by the vice-chancellor and the senior proctor (both Emmanuel men) apparently with the intention of increasing the distance between the Emmanuel and Jesus men [CW]. The practice was unknown after 1802.

²⁹ Hardy [GH] attributes the deficiency of British (i.e. Cambridge) mathematicians to the malevolent influence of the Mathematical Tripos. However, more general social and political factors must have played a significant part.

ment of differential calculus, while continental mathematicians bounded ahead using the techniques of his arch-enemy Leibniz. The influence of Newton on the Mathematical Tripos can easily be seen from examination papers right up to the the early decades of this century.

The history of the Mathematical Tripos up to the turn of the century is described by Rouse Ball [RB]. In the mid-fifteenth century, the examinations for the Bachelor of Arts degree consisted mainly of a dispute, or *wrangle* between the candidates and the various examiners, in front of the proctors. The subjects studied by Medieval students for their BA degree were Grammar (Latin), Logic and Rhetoric. The disputes were usually on some point of scholastic philosophy and were conducted in Latin.³⁰ The examinations were held three times each year, the most important (i.e. for the best men) taking place on Ash Wednesday in Great St Mary's Church. On this occasion, the dispute was led by a certain 'Ould Bachilour', who represented the University and sat on a ceremonial three-legged stool. This stool was called a *tripos*. The ceremony was taken very seriously, as befitted its timing and setting.

In the sixteenth century such ceremonies were not in keeping with the prevailing spirit of puritanism, and became something of a farce. The role of the Ould Bachilour degenerated and his opening speech became an occasion for jokes and gibes at the expense of the University authorities. He acquired the title 'Mr Tripos' and his humorous orations were known as 'Tripos speeches'. It was also the tradition for Mr Tripos to produce and circulate witty and scurrilous verses for each examination. The earliest Tripos verses still in existence date back to 1575.

At the beginning of the eighteenth century, a new type of examination was instituted in which all the candidates were examined together. This was made necessary by the disreputable state of the disputation examinations, and it was made possible

³⁰ These three subjects were referred to as the *trivium*. For the MA degree, students studied the *quadrivium*, namely Arithmetic, Geometry (including Geography), Music and Astronomy.

by the completion in 1731 of the new Senate House. From the beginning, the examination took place in English, and, at least until the 1770's, it was entirely oral. Even so, the new method of examining allowed a much more accurate comparison of the candidates to the extent that in 1747 it was thought appropriate to produce an order of merit list. This list was printed on the back of the Tripos verses and so became known as the Tripos lists. It was then a short step for the examinations to become Tripos examinations.

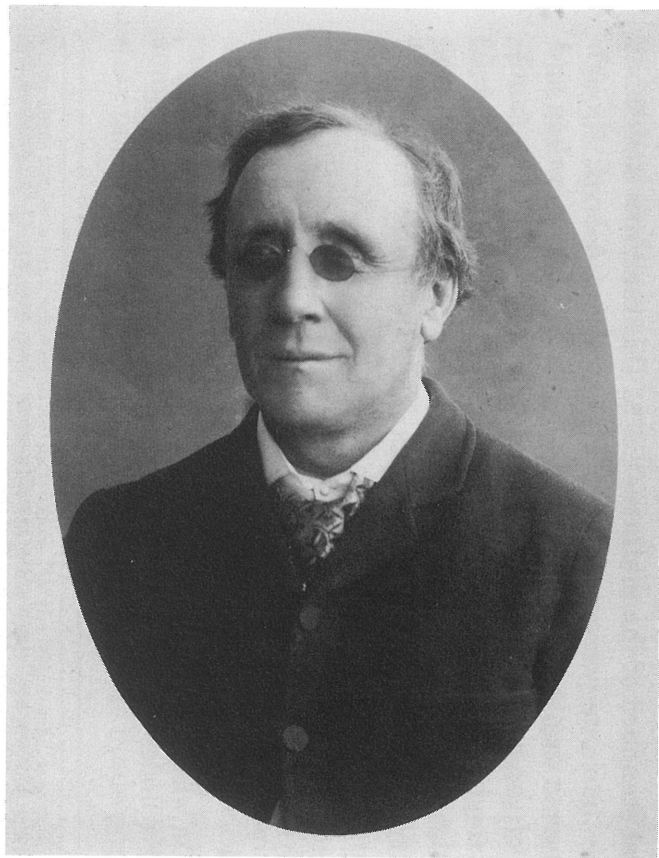
The Tripos lists were divided into three classes: the Wranglers and the slightly less distinguished Senior Optimes were grouped together in the top class; then came the Junior Optimes and finally the *οι πολλοι* (Poll men) who passed, but without Honours. At the head of the list was the Senior Wrangler and at the foot was the Wooden Spoon.

The minimum qualification for a pass, according to an edict of the examiners in 1799, was a competent knowledge of Arithmetic, Vulgar and Decimal Fractions, Simple and Quadratic Equations, the first book of Euclid, and Locke and Paley.³¹ The general standard of the mathematics at this time was somewhat higher than our present Further Mathematics A-level; though the present day student would find the terminology puzzling and some of the material decidedly unfamiliar. For example, candidates might be asked to 'Construct the cubic $a^2y - x^2y - a^3 = 0$ ' and the calculus questions were of course phrased in terms of Newton's fluxions and fluents. Two questions from 1802 were:

A person's face in a reflecting concave decreases to the principal focus and then increases in going from it. -Required a demonstration.

On what point of the compass does the sun rise to those who live under the equinoctial, when he is in the northern tropic.

³¹ i.e. Paley's *Evidences*. Paley's great granddaughter Mary was one of the original five students at Newnham. She later married the economist Alfred Marshall.



Henry and Millicent Fawcett



Third and fourth year students, Newnham College, 1880. Philippa Fawcett is third from the right in the back row. Her friend and fellow mathematician Margaret Tabor is standing third from the right in the third row.



Philippa Fawcett (on the left), with friends Clotilde Bayne (later Marson), Constance Crommelin (later Mrs John Masefield) and Dora Pease.



Newnham College hockey team, 1891. Philippa Fawcett is on the right of the front row. Catherine Holt is on the left of the middle row.



The opening of the Fawcett Building, Newnham College, in 1938. The speaker is the Principal, Pernel Strachey. On her left is Queen Mary and Philippa Fawcett is on the far left.

Mathematical Tripos, Part I. 1890

MODERATORS: {WALTER WILLIAM ROUSE BALL, M.A., *Trinity College.*
 {ARNOLD JOSEPH WALLIS, M.A., *Corpus Christi College.*
 EXAMINERS: {WILLIAM LOUDON MOLLISON, M.A., *Clare College.*
 {EDWARD GURNER GALLOP, M.A., *Gonville and Caius College.*

WOMEN

Wranglers.

FAWCETT, P. G. Newnham
 (above the Senior Wrangler)
 Field, F. A. Girton
 (equal to 21)
 Lea, M. Girton
 (between 27 and 28)

Senior Optimes.

Vinter, F. V. Girton
 (between 40 and 41)
 M^cAulay, M. Newnham
 (equal to 41)
 Webster, J. B. Girton
 (equal to 45)
 Appleyard, E. Newnham
 (equal to 46)
 M^cAfee, M. Girton
 (equal to 47)
 Deckers, A. Newnham
 (between 53 and 54)
 Lloyd, E. M. Newnham
 (equal to 55)
 Atherton, M. R. Newnham
 (equal to 57)
 Gaul, L. J. Girton
 (equal to 57)
 Parsons, E. M. Girton
 (equal to 62)

Junior Optimes.

Tabor, M. E. Newnham
 (between the brackets 72 and 75)
 Hodge, M. A. Girton
 (equal to 77)
 Gullan, O. J. Girton
 (equal to 83)
 Crook, F. L. Newnham
 (equal to 91)

By 1890, the Mathematical Tripos had developed into a severe test not so much of mathematical ingenuity as of stamina and solid ability. It was, according to Hardy [GH], at its zenith. Candidates sat twelve three hour papers in two short bursts, each paper containing up to sixteen fairly substantial questions. The topics ranged from compound interest to number theory, hydrodynamics and astronomy. Candidates were expected to be familiar with the works of Newton and Euclid, to be able to predict eclipses, to manipulate obscure trigonometrical identities and to be on intimate terms with all possible two and three dimensional conics.

This heroic style of Tripos had many detractors, particularly in later years. Littlewood [LW] was implacably opposed to it. He looked through the mark books of one of the examiners in the early 1880's, and discovered that in one particular year, the maximum possible mark was 33,541. The Senior Wrangler obtained 16,368 (i.e. about 454 marks per hour) and the Wooden Spoon a total of 247; however he was unable to find evidence that ability failed to be rewarded in the examination.

§5 Philippa Garrett Fawcett (1868-1948)

Philippa Fawcett was born on 4th April 1868. Not much is known about her life. Very few of her papers or letters survive. Her father died when she was fifteen so she hardly features in the various accounts of his life. Her mother died when Philippa was sixty one, but apart from a few pages about her time at Newnham, she receives only passing references in Dame Millicent's memoirs [MF].

The Fawcetts were rather advanced in their treatment of their daughter [RS], allowing her much more freedom than was the custom at that time. Millicent Fawcett kept up her various activities while still spending time with Philippa to the extent of looking after her at times when more conventional families would have used a nanny. As an only child, Philippa must have led a slightly isolated existence. Her isolation was perhaps increased by the incessant bustle of intellectual activity in the Fawcetts'

houses and by her parents' complete devotion to and reliance on each other. It is also suggested [BV] that her mother, typically well aware of the possible pitfalls of bringing up an only child, was perhaps too careful not to over-indulge her.

Despite being born into this exceptional household, Philippa's childhood seems to have been fairly normal. She screamed incessantly for her first few months, which her mother put down – at least, retrospectively – as an indication of 'nascent mental activity'. She had dolls to whom she talked and a dog called Oddo who was supposed to talk to her, in a broad East Anglian accent. She had the usual toys, including a wooden horse on wheels, which she discovered would not move at all if it was pulled gently, but if pulled hard, would come with a great rush; her father, on hearing of this peculiarity, named the horse Gladstone [RS].

She received her earliest education from Jane McLeod Smith,³² a friend of the Fawcetts, who used to read to Henry Fawcett. She ran a little day school for the children of her friends in Cambridge. Philippa was later sent to Clapham Middle School, on the north side of Clapham Common, and then to Clapham High School, which was one of the new crop of Girls' Public Day School Trust Schools.³³ For part of the time, when her parents were living in Cambridge, she boarded with a family in Worcester Park, though she stayed with her parents when they occupied their London home, 51, The Lawn, Lambeth, walking the two miles to school alone. At the age of fifteen, she showed such significant mathematical ability that her parents organised special coaching for her from G.B. Atkinson of Trinity Hall. She also attended courses at Bedford College, where she studied mathematics and chemistry [BV] and at University College London, where she took courses in Pure Mathematics

³² Miss Smith was a student at Newnham in 1872, its second year of existence. Later, she gave lectures to women students on English Literature. Jane's younger sister was also a Newnham student, and college lecturer.

³³ The school was founded in 1882, but amalgamated in 1938 to form Streatham Hill and Clapham High. At that time it was associated also with a teachers' training college. Most of the departments of this college were closed and only the kindergarten section now remains; it was renamed Philippa Fawcett College in 1953.

and in Applied Mathematics and Mechanics from 1885 to 1887, at four guineas a course. For the second year she studied in the company of G.T. Bennett who was later to become the Senior Wrangler below her.³⁴

Millicent Fawcett was at the 1887 Bayreuth festival when she received the news of her daughter's splendid Higher Local Examination results; first class with distinction in Latin, Algebra and Euclid, and good marks in all the other subjects. Philippa's reward was a Gilchrist scholarship to study mathematics at Newnham College. She arrived at Newnham in the autumn of 1887.

§6 At Newnham

As a Newnham student, Philippa led a disciplined and orderly life. Her time was mapped out every day. She was well known for rising promptly at 8.00, and rarely going to bed after 11.00.³⁵ She was quiet in manner and conventional in appearance and behaviour. According to a correspondent of the *Pall Mall Budget*³⁶ (June 12, 1890),

When she was younger, Miss Fawcett dressed aesthetically, with no proper horror of old clothes, wore her thick brown hair down on her shoulders, and has even been known (so I have heard) to ride on the top of a bus.

When she started at Newnham, it was thought prudent to improve her image slightly, so as not to give ammunition to those 'who try to make out that the women's colleges are peopled by eccentrics'. A contemporary Newnham mathematics

³⁴ It was not at all unusual for students to have attended another university course before taking the Mathematical Tripos; Littlewood [LW] claims to have been so discouraged in examinations by the rapid scribbling of one such student, who had previously been at Manchester, that he was obliged to move to a desk further away.

³⁵ A survey on the health of women students, undertaken by Mrs E.M. Sidgwick (Principal, 1892-1911, and wife of Professor Henry Sidgwick), reveals that Newnham students at this time slept on average 8.01 hours. Girton students needed rather more (8.11) hours.

³⁶ Probably W.T. Stead, who was a close friend of the Fawcetts. He was well known for his campaign to raise the age of consent. Millicent Fawcett was apparently instrumental in securing his release when he was imprisoned for buying a thirteen-year-old girl (as a ploy in his campaign). He died on the Titanic and now keeps Henry Fawcett company on the Victoria Embankment.

student, Margaret Tabor, remembers her with her hair cut in a short fringe, wearing a pink Liberty frock, and 'suggesting one of Botticelli's pages'. Alice Gardner notes in her *Short History of Newnham College*:

Besides being one to whose brilliant mathematical powers the highest honours were due, she was a singularly suitable person for this distinction [i.e. her Tripos result] in that she exemplified so many of the qualities popularly supposed absent from the character of a university woman. She was modest and retiring almost to a fault, trying, though not always successfully, to counteract the impression made by her personality, so as to appear like a very ordinary person.

Catherine Holt, in her letters home is more blunt:

19th October, 1889: I have been to two coffee parties this afternoon . . .; the other at Miss Pease's where I met Miss Fawcett and Miss Bowen – we were such a nice quartet for talking, except that Miss Fawcett is very quiet.

Other letters by Miss Holt give an idea of life at Newnham at this time:

The food here is distinctly not good, everyone is agreed on that; the puddings are practically untouchable, the preserved stewed fruit is often fermented, the meat is sometimes raw and generally semi-tepid; vegetables are few and far between; people say that they only give us what is grown in the garden; these are for the most part turnips. At breakfast we vary between sausages and bacon, both most uninviting, and occasionally a little fish; but there is a plentiful supply of white and brown bread on an occasional toast rack. At afternoon or evening tea, we cut our own bread and butter. Evening tea is at 7.30; so I brew my own cocoa about ten and have some rusks, unless I have an invite out. No one goes to bed before 10.30, and the baths which are next to my room go on till 11.00.

Later, Miss Holt continues the theme in optimistic vein:

They say that in Tripos week here, there is a special table for Tripos people where they are fed like prize turkeys.

However, when Tripos time came round, she was disabused of this notion:

We [i.e. the students] have elaborate feeding arrangements, administering soup each night and giving the victims a good supper.

Philippa put in a regular day's work of six hours, *very* rarely exceeded.³⁷ She was coached³⁸ by Mr E.W. Hobson of Christ's, the Senior Wrangler in 1878, who was judged to be the second best coach, after Mr R. Webb of St Johns.³⁹ She also took a keen interest in physics, attending the practicals conducted by J.J. Thompson, who was then experimenting with the passage of electricity through gases, on the way to discovering the electron.

Aside from her work, Philippa had a variety of interests. She played hockey for the first Newnham team with enthusiasm,⁴⁰ she enjoyed walking and was an excellent needlewoman. She was also in the College fire brigade (though perhaps this was a duty rather than an interest) and in the college debating society, where she sat on the Liberal front bench. Above all, she loved literature – Dante (in Italian), Heine, Shakespeare, Milton, Wordsworth and Jane Austen were among her favourites, and she knew a great deal by heart. One of her mother's anecdotes involved a visit by Philippa and her father to Edward Fitzgerald, who asked the fourteen year old what books she liked best. Philippa responded, apparently to his horror, 'Thackeray's and George Eliot's'. He gave her a biography of George Crabbe and a selection of his poems, 'perhaps as an antidote'. Her love of

³⁷ In Shaw's *Mrs Warren's Profession*, written in 1894, Vivie Warren studied for the Tripos at Newnham. It meant 'grind, grind, grind for six to eight hours a day at mathematics'. She decided it was not worth her while to face the grind required to become top 'as Philippa Summers had', but to please her mother, she offered to try (on payment of £) for fourth Wrangler or thereabouts. She came equal third.

³⁸ It was normal to have an individual coach at that time, from whom much more was learned than from lectures. The idea was to cram for the Tripos, rather than learn mathematics. When Philippa later coached Newnham students, she was considered unusual for never mentioning the examination. The practice of coaching was largely extinguished by the Tripos reforms of 1910.

³⁹ The top four Wranglers in 1890 were all coached by Webb.

⁴⁰ She was a member of the victorious side in the Newnham-Roedean match in 1891. Miss Clough sent a bouquet of red roses in congratulation.

literature seems to stem from her time with Jane McLeod Smith. Music, however, left her cold; she once remarked to her friend Margaret Tabor that she 'supposed it was the National Anthem she had just heard, because everyone stood up'.⁴¹

Some interesting data on Philippa's physical appearance come from the researches of Mrs Sidgwick. In 1898, she sent to all Oxford and Cambridge students, past and present, a detailed questionnaire on their health, habits and lifestyle. The aim of this research was to discredit the popular opinion that a university women were likely to be feeble, frail and hysterical things, lacking in fecundity and liable to sink into an early grave.

Philippa seems to have filled in a particularly detailed version of the questionnaire. We read that at the age of 30, her skin was ruddy, her hair was brown and wavy and her eyes were light/medium. Her face was of medium shape, with 'neutrally conspicuous' cheek bones. Although her mathematics were outstanding, her ears were apparently not. There are detailed measurements on the shape and size of her head and nose; for example, her nose was 4.9 units⁴² long and 3.1 units of breadth, presumably not at the bridge, since her interocular distance was only 2.9 units. Her breathing power was 180 (maybe her hockey helped with that) and her pull as an archer was 53 pounds, roughly the same as her right hand squeeze. Whether or not these statistics helped Mrs Sidgwick's case is not recorded.

§7 Tripos Time

At Newnham Philippa continued to shine academically. There was no doubt that she was amongst the top handful of mathematicians of her year. The first real comparison came in her second year when she sat the Trinity Intercollege Examination. She scored 1334/2700, which was 75 marks higher than the top

⁴¹ A surprising contrast to her mother's passion for music.

⁴² Centimeters presumably, though some of the other measurements are harder to fathom.

Trinity man, and more than three times the total marks of the two other Newnham candidates put together. There was no doubt that she would excel in Tripos.

Unlike her father, Philippa approached her Tripos examinations with her usual orderly calm. She refused to take a few days away from Cambridge beforehand on the grounds that it would disturb her routine. When asked whether she wished it was all over, she replied that she wouldn't want to wish away three weeks of her life.

A few weeks before the examinations Mrs Fawcett wrote to Clotilde Marson:

I am going to Cambridge tomorrow week and shall have my last sight of P.G.F. till after the exam. I have made up my mind not to be too anxious about it. There are a great many better things in the world than beating other people in examinations.

The examinations started in mid-May. The women candidates sat in the YMCA round the ceiling of which, according to Catherine Holt, ran a most objectionable legend:

'If thou do well, the pain fades, the joy remains; if ill, the joy fades, the pain remains'. I cannot imagine anything more dispiriting for exam purposes.

Miss Clough, still the Principal of Newnham, wrote to Mrs Fawcett on 30th May:

I am glad to tell you that Philippa is keeping up her strength and spirits – she really seems very well and has slept well. Her great friend Theresa Lawrence⁴³ told me that she [Philippa] thought the first three days' papers dull and got tired of them. Yesterday she seemed excited and she told Theresa that they were hard and interesting. She went on the garden yesterday evening with my niece [Blanche Athena Clough] and Dora Pease. They made a good supper of bread and milk and bread and butter. She keeps up her appetite. Mr Hobson [Philippa's coach] seems most interested. He has heard that Philippa has done well in the first part.

⁴³ Theresa was the sister of Penelope, the founder of Roedean.

She added a postscript the next day:

Philippa came back this morning rather disappointed. She said she had done 3 problems and tried at 6 or 7. However she went back in grand spirits – our other students had not done anything as far as I could learn but make attempts.

The examinations finished on 31st May and the results were due to be read out at 9.00 on the morning of Saturday 7th June in the Senate House.⁴⁴ Expectations were high. The Intercollege Examination was not the only portent; the system of coaching also allowed fairly accurate predictions of examination potential,⁴⁵ and Philippa's coach was confident.

§8 The Great Day

The night before the results were read, G.F. Browne received a visitor. As secretary for the Local Examination Syndicate, Browne had been responsible for drawing up the regulations for stating the precise position in the men's order of merit held by women students in the Tripos. The rule was that the Senior Moderator would read the women's list after the men's, placing them either *equal to* a position on the men's list, or *between* two positions, as appropriate. The visitor was the Senior Moderator, W.W. Rouse Ball, who had come to ask for guidance on an unforeseen situation [GB]:

After a moment's thought, I said 'Do you mean one of them is the Wooden Spoon?'

'No, it's the other end!'

'Then you will have to say, when you read out the women's list, "Above the Senior Wrangler"; and you won't get beyond the word "above".'

⁴⁴ The results of the Mathematical Tripos are still read out in the Senate House, at 9.00 a.m. on the Thursday of 'May Week'. Since the reform of 1910, the list is no longer read out in order of merit; in fact, there is no longer a Senior Wrangler or a Wooden Spoon.

⁴⁵ There were sometimes surprises; William Thomson, later Lord Kelvin, a brilliant mathematician who had already spent six years (since the age of eleven!) at Glasgow University, is supposed to have sent his gyp to the Senate House to find out who came *second*, and was not very happy with the reply 'You did, Sir'.

On the Saturday morning, nearly all of Newnham trooped down to the Senate House. Mrs Fawcett 'felt too keenly about what I was almost certain was going to happen' to dare to be present, but Philippa's grandfather Newson Garrett, no doubt tipped off by his grandson Philip (then in his first year as a mathematician at Trinity), drove over from Aldeburgh with two of Philip's sisters, Marion and Christina, and took lodgings in Jesus Lane. Marion sent the following account to her mother:

It was a most exciting scene in the Senate this morning. Christina and I got seats in the gallery, and Grandpapa remained below. The gallery was crowded with girls and a few men, and the floor of the building was thronged by undergraduates as tightly packed as they could be. The lists were read out from the gallery and we heard splendidly. All the men's names were read first, the Senior Wrangler [G.T. Bennett of St John's] was much cheered.

There was a good deal of shouting and cheering throughout; at last the man who had been reading shouted "Women". The undergraduates yelled "Ladies", and for some moments there was a great uproar. A fearfully agitating moment for Philippa it must have been; the examiner, of course, could not attempt to read the names until there was a lull. Again and again he raised his cap, but would not say "ladies" instead of "women", and quite right, I think. He signalled with his hand for the men to keep quiet, but he had to wait some time. At last he read Philippa's name, and announced that she was "above the Senior Wrangler".

There was a great and prolonged cheering; many of the men turned towards Philippa, who was sitting in the gallery with Miss Clough, and waved their hats. When the examiner went on with the other names there were cries of "Read Miss Fawcett's name again," but no attention was paid to this. I don't think any other women's names were heard, for the men were making such a tremendous noise; the examiner shouted the other names, but I could not even detect his voice in the noise. We made our way round to Philippa to congratulate her, and then I went over to Grandpapa. Miss Gladstone⁴⁶ was with him. She was, of

⁴⁶ Daughter of the Prime Minister and a vice-principal of (i.e. a tutor at) Newnham.

course, tremendously delighted. A great many people were there to cheer and congratulate Philippa when she came into the hall. The Master of Trinity and Mrs Butler⁴⁷ went up into the gallery to speak to her.

Grandpapa was standing at the bottom of the stairs waiting for Philippa. He was a good bit upset. I entreated him not to upset Philippa, and he said he wouldn't. He pressed something into her hand – a cheque, I fancy. [It was in fact a diamond ring.] She was very composed. A great many of the Dons came to shake hands with her. The undergraduates made way for her to pass through the hall then they all followed her, cheering, and I saw her no more. Grandpapa called the servant girl of our lodgings up as soon as we got in, gave her ten shillings, telling her first [inaccurately] that his granddaughter was Senior Wrangler. He said, "You are the Landlady's daughter, aren't you?" She, not wishing to lose the ten shillings, said, "Not quite." He replied, "Very nearly," and gave her the tip. Grandpapa is now lying down.

George Forrest Browne was the first to shake the hand of the daughter of his old friend. Then Philippa came down from the gallery. The men on the floor below formed themselves into two rows between which she had to process, flanked and supported by Miss Clough and Miss Gladstone. When they got back to Newnham, they were received with cheers, and all the bells and gongs which could be found. Philippa was carried in triumph into the hall and, with characteristic calmness, marked herself "in" on the board on the way.

That evening an impromptu feast was held in Clough Hall. A bouquet of roses, carnations and orchids was presented to Philippa on behalf of the College. Mrs Fawcett, having been telegraphed, rushed up to Cambridge to be present. An account of the festivities can be found in the North Hall diary [NH]. Miss Clough gave a speech, proposed a toast to Miss Fawcett and ended with the hope that it would be a lesson to all of them – to go to bed early. Philippa responded with a toast to her coach, Mr Hobson of Christ's. Many more toasts were

⁴⁷ Née Agnata Ramsey, Senior Classic, of Girton.

offered. The dinner was followed by a dance for which the halls of Newnham were lit up by each student placing her lamp in her window. There were Chinese lanterns and fairy lights, and the buildings were festooned with flags. A lay, in the style of Macaulay, was composed, which began

Hail the triumph of the corset
Hail the fair Philippa Fawcett.
Victress in the fray
Crown her queen of hydrostatics
And the other Mathematics
Wreath her brow in bay.

At 9.30, a huge bonfire was lit on the hockey field, round which Philippa was carried three times, while everyone sang 'For she's a jolly good fellow'.

On Monday, the events in Cambridge made headlines in all the national newspapers. The *Daily News* ran the headline 'A Lady beats the Senior Wrangler' and suggested that she should be called the Lady Senior Wrangler. The news digest in the *Telegraph* announced that 'G.T. Bennett is Senior Wrangler. Miss G.P. [sic] Fawcett is, however, placed above him.' In the main article, the education (school, and university coach) of the first four (male) wranglers was given; but it was only said of Miss Fawcett that she was the daughter of the late Postmaster-General. However, in a long leading article, much is made of Miss Fawcett:

Once again has woman demonstrated her superiority in the face of an incredulous and somewhat unsympathetic world. [Then follows a list of various academic triumphs]. And now the last trench has been carried by Amazonian assault, and the whole citadel of learning lies open and defenceless before the victorious students of Newnham and Girton. . . . There is no longer any field of learning in which the lady student does not excel. Miss Fawcett has added the last, and possibly most coveted laurel wreath to grace the lofty brows of womanhood. We are more than gratified by this result because it removes from our minds one of those lingering doubts which have sometimes interfered with the full and frank admission of feminine superiority.

The *Times*⁴⁸ ran a much more considered (and possibly more sincere) piece, linking the event to the wider issues, and ending with a graceful (at least in intention) tribute to Professor Fawcett:

There could be no more appropriate memorial to such a man as Mr Fawcett was, so true to the cause of women, so faithful in his love of Cambridge, than one which made his daughter's attainment to the highest distinction which Cambridge can bestow on a student the occasion for renewed efforts on behalf of the Higher Education of Women.

A fortnight later the *New York Times* produced several columns under the heading 'Miss Fawcett's Honor: The sort of girl this lady Senior Wrangler is'. The *Pall Mall Gazette* and the *Women's Penny Paper* organised a subscription fund to mark Philippa's achievement and the (rather small) sum raised was presented to Newnham College Library.

All the accounts found time to commiserate with the unfortunate Mr Bennett – not because he was beaten by a woman (they hasten to add) but because of the anomaly of being Senior Wrangler without coming top; and because he would be remembered for this and not for his mathematical excellence (which proved to some extent to be the case, as his obituaries show).

Mrs Fawcett and her daughter were much fêted that summer. Telegrams arrived at their house in Gower Street 'like snowflakes in a storm'. Dr Montagu Butler, the Master of Trinity, wrote to Mrs Fawcett:

I only wish you could have seen your dear daughter in the Senate House at the moment of her triumph. You could not have seen a more perfect picture of modest maidenly simplicity. This can be no surprise to you or to any who have known her. Still, the picture presented was singularly impressive and touching.

A friendly examiner sent (confidential) details of Philippa's examination performance:

⁴⁸ The *Times* article was written by James Thurfield. An extract from Millicent Fawcett's response to him is given on the title page.

She was ahead on all the papers but two, so that her examiners were sure that her place had no element of accident in it, but that in any similar examination she would have accomplished the same feat. Her work was similar to that of her father⁴⁹ but with greater mathematical knowledge. No shots [i.e. false attempts, guesses], no sheets of paper wasted, but grasp of question and proper application, the only errors and erasures being unimportant ones of analysis, and these only occasional.

Philippa's coach told Mrs Fawcett that it had been a strong year, and that Philippa was 400 marks, or 13% ahead of the Senior Wrangler. Emily Davies telegraphed 'Magnificent news, almost overwhelming'. Philippa and her mother were invited to a garden party at the home of Lord Hartington, the Chancellor of the University.

He stood melancholy and bored receiving the long file of guests and shaking hands with each; somehow, as my daughter and I [Millicent Fawcett] approached him, another girl slipped between myself and her, so that when it became our turn to be shaken by the hand, Lord Hartington said solemnly 'I congratulate you' to the wrong girl. Philippa's comment on this was characteristic. 'I gave a hasty glance at her and thought she was better for the cause than I was, though not all one could have wished, so it was better as it was.'

Perhaps the most valued congratulations came from Henry Sidgwick: 'Who would have thought, at that first meeting in your house, that the little girl who was trotting about would one day be above the Senior Wrangler?'

§9 After Tripos

It was naturally thought that Philippa would fade in Part II of the Mathematical Tripos, which required more ingenuity and originality than Part I. Nevertheless, the next year she was placed in the top division of the first class, along with G.T. Bennett. The following year, she was awarded the Marion Kennedy

⁴⁹ 34 years previously!

Scholarship at Newnham which allowed her a further year of mathematical study.⁵⁰ During this year, she made her only contribution to mathematical research, in the form of a long and technical paper on the motion of helical bodies in a liquid, which was published in the *Quarterly Journal of Applied Mathematics*.

After this, she became a college lecturer at Newnham, and much of her time was taken up in teaching. She is remembered by a former student for her speed, concentration and her infectious delight in what she was teaching, and also her patience with students who were trying their hardest.

The impressions of a new student at Newnham who arrived before the beginning of term, and so had to eat with the Fellows on high table, seems to reinforce the various other accounts of Philippa's personality:

We were overwhelmed with awe when we found ourselves sitting opposite Miss Helen Gladstone and Miss Philippa Fawcett. I don't remember much of Miss Fawcett's conversation, but it must have had some connection with going abroad, for I remember her mention of Boulogne as 'You know, that place we can none of us pronounce'. I felt that she was quite human even if she had been 'above the Senior Wrangler'.

Miss Gladstone's conversation, on the other hand, was rather clearly recalled.

Foreign travel was in fact much to Philippa's taste. As a child, she had travelled abroad several times; she had been to Switzerland (later a favourite haunt) with her mother and aunt Elizabeth, and also with her mother and her friend from Clapham High School, Clotilde Marson. (Clotilde called Philippa 'Chip' and Philippa's mother 'Aunt Milly'.) In November 1899, she started a nine month world tour with Miss B.A. Clough,⁵¹ ac-

⁵⁰ Marion Kennedy was one of the two daughters of Benjamin Hall Kennedy, Professor of Greek, Canon of Ely Cathedral, and author of *Kennedy's Latin Primer*. He was one of the earliest and best friends of Newnham, according to Millicent Fawcett, although he believed that the foundations of Society would crumble if married women were allowed the vote.

⁵¹ Blanche Athena Clough was Anne Jemima Clough's niece. She was on the staff of Newnham at that time, and later became principal.

accompanied as far as India by two other friends from Newnham. She recorded the details of this tour in two diaries [BV] which offer evidence of a great affection for children, a keen interest in architecture and a dispassionate⁵² approach to life. Just before Tripos time, she sent a telegram of good cheer to the candidates from Yokohama.

In 1901, she made the trip to South Africa with her mother which was to shape the rest of her life.

§10 Beyond Newnham

2 Gower Street W.C.
July 12. 1902

Dear Miss Kennedy,

You will remember that I told you last March that there was a possibility of my receiving an appointment in Johannesburg as lecturer in mathematics at the Normal School there. I have now heard from the Colonial Office that the appointment is confirmed subject to my being confirmed as physically fit for the task. I have been to the Colonial Office doctor this morning. His report is to be sent direct to the Secretary of State, and is not communicated to me; but there is practically no doubt that it will be satisfactory. I therefore feel that I ought to place the resignation of my post of staff Lecturer of Newnham College in your hands at once, without waiting for the formal confirmation of my new appointment.

I need hardly say that it is with great regret that I leave Newnham, but I think that the new work should be interesting.

I do not know yet when I am to sail, but it will not be until after July 22.

I hope that the fact of my not having been able to send in my resignation before the last Council meeting has not caused you serious inconvenience.

Believe me, Dear Miss Kennedy
Philippa Fawcett

Philippa's career was a source of anxiety to her mother. Clearly it was desirable to follow up her assault on the Math-

⁵² Her two visits to the Taj Mahal resulted in the entry: 'In the evening we went to see it again. It was looking well, but I'm sure I like it best by sunlight'.

ematical Tripos with some other trail-blazing work, but what should it be? She produced a number of suggestions (which did not include teaching mathematics at Newnham) for her daughter's consideration: astronomer; physicist; lighthouse designer; engineer; or perhaps another male bastion should be tackled, in the style of her aunt Elizabeth, such as the legal or actuarial professions.

Perhaps not surprisingly, given her background, Philippa also felt that teaching mathematics at Newnham college was not sufficiently enterprising for a life's work. However, with her natural humility and retiring disposition, she was not cut out to be a pioneer in the mould of her mother and aunt. She had lived in college for fourteen years and now the opportunity arose to widen her horizons. When she visited South Africa with her mother, she had witnessed the conditions in the concentration camps, and noted the eagerness of the people in them to get education. Accordingly, (and perhaps having received a nudge from above) she applied to the government for permission to return to South Africa to take part in the setting up of permanent education machinery in the Transvaal. At the age of thirty three, she resigned her post at Newnham.

Part of Philippa's time in South Africa was spent training mathematics teachers at the Normal School in Johannesburg. On arrival, she wrote home to a friend [BV]:

The Normal School of which I am supposed to be a lecturer does not exist yet; the buildings for it were only secured the day before yesterday! So at present my duties are of a very varied character. One of the interesting things about a new country I think is that everybody is supposed to do anything that happens to turn up.

One of her varied duties was to act as private secretary to the Director of Education, in which capacity she was mainly concerned with the development of a system of farm schools which would meet the demands of the Boer population spread across the Veld. Clearly, this was a delicate task, for which it was necessary to win the confidence of people with whom Britain had

just finished a brutal war. At the time of her death, Sir Fabian Ware, who became Director of Education in Transvaal, wrote:

There is no doubt that Philippa Fawcett's dazzling academic honours assured her a large measure of confidence from the British population and her political ancestry gave her points of contact with the Boers, whose sympathy her very distinguished mother had won.

Her friend from the Mathematical Tripos, Margaret Tabor, visited her in 1904 and reported that she lived on the Veld outside Pretoria, alone except for a servant and two fierce dogs.

Although the work in South Africa had no direct connection with the Women's movement, it was real pioneer work and Millicent Fawcett approved. Nevertheless, she kept her ear to the ground in the hope that something more suitable, and nearer home, would turn up. When the post of principal assistant to the Director of Education in the newly formed London County Council was advertised, she discreetly enquired whether a woman would be considered and learned that it was a possibility which had not been thought of, but which could not be excluded. At this time, the Council was just beginning to institute its own secondary schools as a result of the 1902 Education Act. This was also pioneering work. Accordingly, Mrs Fawcett cabled her daughter suggesting she should apply.

Philippa was offered the post in 1905, remarkably⁵³ without interview and at the same salary as a man would have received. Much of her work was concerned with the development of secondary schools, and in particular maintaining relationships between the governing bodies of the existing schools and their new controller, the LCC. She was designated Assistant Education Officer (higher education) in 1920. Two teachers training colleges, Avery Hill and Furzedown, were established during her tenure of office and, at a time of difficulty, she acted as principal of the former. She was also much involved with the London Day Training College, which was later transferred, under her guidance, to the

⁵³ In the Government Civil Service, as opposed to the LCC, women could only compete on equal terms with men for jobs after 1925, and equal pay followed only after the second world war.

University of London and became the Institute of Education.

Philippa Fawcett retired on 4th April 1934, and was presented, amidst many tributes to her contribution to education in London, with a wireless set, a fountain pen and a cheque which she used to buy flowering shrubs for a barren patch of ground close to her home.⁵⁴

For the majority of her working life, she lived with her mother and aunt Agnes in the house in Gower Street upon which the telegrams had fallen like snow in 1890.

§11 Three Senior Wranglers

It is sometimes said that Geoffrey Thomas Bennett 'never recovered from being Senior Wrangler for only fifteen minutes' (by which is meant the time between the reading of the men's results and the women's results). Aside from a neat turn of phrase (though inaccurate: Bennett was Senior Wrangler for the remainder of his life), this assertion seems unlikely to be based in fact. To start with, Bennett can hardly have been surprised by the results of the 1890 Mathematical Tripos; he and Philippa Fawcett had been class-mates for a year at University College, London and must have sat in the same lectures at Cambridge. He would have known about her various examination successes before Tripos.

On the contrary, there is every sign that he recovered quickly. He was placed in the First Class, Division 1, in Part II of the Mathematical Tripos in the following year, and in 1892 was awarded the first Smith's prize for mathematical research. He was made a Fellow of University College in 1892 and Fellow of St Johns in the same year. The next year, he gave his first University lectures, on projective geometry. He then migrated to Emmanuel College where he remained as College Lecturer in mathematics for most of his life. In the first world war, he carried out

⁵⁴ She was fond of gardening; it is recorded in the North Hall Diary that in 1901 Miss Tuke offered prizes for an English Sonnet and a poem in blank verse, while Miss Fawcett offered a prize for the best garden. This went to W.M. Hudson (who was placed in Class I, Division 1, of Part II of the Mathematical Tripos that year), but the hope of it produced a marked improvement in all the allotments.

experimental work on naval gunnery and anti-aircraft defence at Whale Island and afterwards at the Admiralty Compass Observatory at Slough, for which he was awarded the OBE. His main research interest was the geometry of mechanisms, on which he published numerous articles (though his first publication was on Number Theory). He took his Doctor of Science degree in 1920 and was elected a Fellow of the Royal Society in 1914. One of his many interests was in mathematical models and gadgets, of which he built up a large collection, including many different types of boomerang. From his schooldays at University College School he was an enthusiastic cyclist, characteristically owning two bicycles, one for summer and one for winter. From 1929 to his death in 1943, Bennett was Senior Fellow at Emmanuel.

Philippa Fawcett's cousin, Philip Cowell, was Senior Wrangler in 1892. He became a Fellow of Trinity in 1894, but remained in Cambridge only two further years. He then took up the post of Chief Assistant at the Royal Greenwich Observatory. His main interest was in the precise determination of the motion of bodies in orbit, in particular, the moons of Jupiter and Halley's comet. He devised a method of analysing the differential equations by successive approximations which led to a significant improvement on existing calculations (and which anticipated the numerical techniques later used with computers). In recognition of this work, he was elected a Fellow of the Royal Society in 1906, received an honorary degree of Doctor of Science from the University of Oxford in 1910, and the Gold Medal of the Royal Astronomical Society the following year. Then he was offered the post of Superintendent of the Nautical Almanac Office, and he decided to accept it, assuming that he would be able to continue his scientific work. When the necessary support failed to materialise and he found himself caught up in the routine of the office, he had to give up research. He applied unsuccessfully for two Cambridge professorships and eventually retired, disappointed, in 1930, leaving his office precisely sixty years to the minute after his time of birth. His chief interest outside work was bridge; he devised his own system of bidding, which was widely publicised. On his retirement, he moved to

Aldeburgh and played chess for Suffolk. He died in 1949.

The 'Lady Senior Wrangler' of 1890, like the Senior Wrangler, went on to take Part II of the Mathematical Tripos, and the two were placed together and alone in the top division. They were elected Fellows of University College at the same meeting and became Fellows of their Cambridge Colleges in the same year. Then their paths diverged. After ten years of teaching (but not lecturing, which was the province of the University men) Philippa left what she might have regarded as the rather cosy world of Newnham College for South Africa, the land of opportunity. Three years later, she returned to London to take part in the new and exciting developments in education, and live with her mother.

In her quiet way, she supported the family cause, and even made her own significant contributions. A GLC publication, *In the Service of London*, which traces the origins and development of Council employment, reports:

When Philippa Fawcett took up the post in 1905, she became the first professional woman appointed to the Council's permanent staff. Over the next thirty years, she played a central role in the early development of secondary schools and fought successfully for equal pay for men and women in the Council's senior establishment, which was granted in 1919.

In 1910, she promised Bedford College £100, payable when the suffrage was won. Nine years later, it was used to start the Fawcett Scholarships.

While working for the LCC, she was careful not to take too prominent a role in any political activities, believing that a public servant should have no public life. Nevertheless, she worked steadily but unobtrusively for the National Union of Women's Suffrage Societies, often just doing routine work in their Victoria Street offices or selling *Common Cause* on street corners.

She was also a staunch supporter of the League of Nations Union.⁵⁵ She helped develop the junior and schools branches and

⁵⁵ From the mid-1920's, this was the largest and most influential peace society. It opposed pacifism, but espoused the use of sanctions against an aggressor.

later became vice-chairman of the London Regional Federation. When, in 1934-5, the LNU arranged a private nationwide referendum (the 'Peace Ballot'), Philippa was in the forefront of the action. She not only undertook detailed planning for the London area, but also donated large sums of money to provide premises for the work.

Another of the societies she supported was the London and National Society for Women's Service (renamed the Fawcett Society in 1953, in honour of Dame Millicent). She served for a long time on the executive committee and was president from 1945 to her death. She also retained a strong connection with Newnham College; she was an Associate from 1907 to 1922 and attended Roll meetings regularly even after the war, though she was by then somewhat hard of hearing.

Like G.T. Bennett, she made her contribution to the war effort. Hers was not the sort of job one could simply abandon, and even if she had, it is not clear how else she could have used her skills. Instead, she spent her holidays tramping round Yorkshire on a post round, to help release a man for the trenches. In the second world war, she knitted assiduously for the fighting men.

At all times she led a very frugal existence, arriving at work in obviously home-made clothes, carrying her papers and her packed lunch in a string bag. During the second world war, she would shiver in a cold room rather than light a fire as might have been thought allowable by others in their seventies.

Some years after her retirement, Philippa moved to a small flat at Lyttleton Court in the Hampstead Garden Suburb, where she lived alone for the rest of her life. She died on 10th June 1948 two months after her eightieth birthday, just one month after the Grace which allowed women to be awarded the BA degree received Royal Assent, four months before the first such degree was awarded, and fifty eight years after coming 'above the Senior Wrangler'.

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The front cover shows Philippa Fawcett as a Newnham student.

The inside covers show an extract from the North Hall Diary of Newnham College, written in 1890.

The back cover shows a card made for Philippa Fawcett by her friends. The initials NC and AJC refer to Newnham College and its Principal, Anne Jemima Clough. The Greek quotation is from Euripedes' *Alcestis*. 'By having dared this noble deed she has made life more honourable for all women' is the literal translation, but a more heroic rendering is possible.

May Term, 1890.

amid shouts of triumph, & the strains of "For she's a jolly good fellow." Finally our neighbours from Selwyn, carried away by their enthusiasm, came into the College grounds in a body, & raised three cheers for Miss Fawcett.

1891.

In June, 1891, P. G. Fawcett again achieved a signal success in Mathematics. She was placed in the first division of the first class of the second part of the Mathematical Tripos. She is the first woman who has attained to this high distinction in the Tripos.

A further triumph was also won this year for the College through A. J. M. Elliot's success in the second part of the Natural Science Tripos. She took a first class in two subjects, which has not been done before by any woman student.

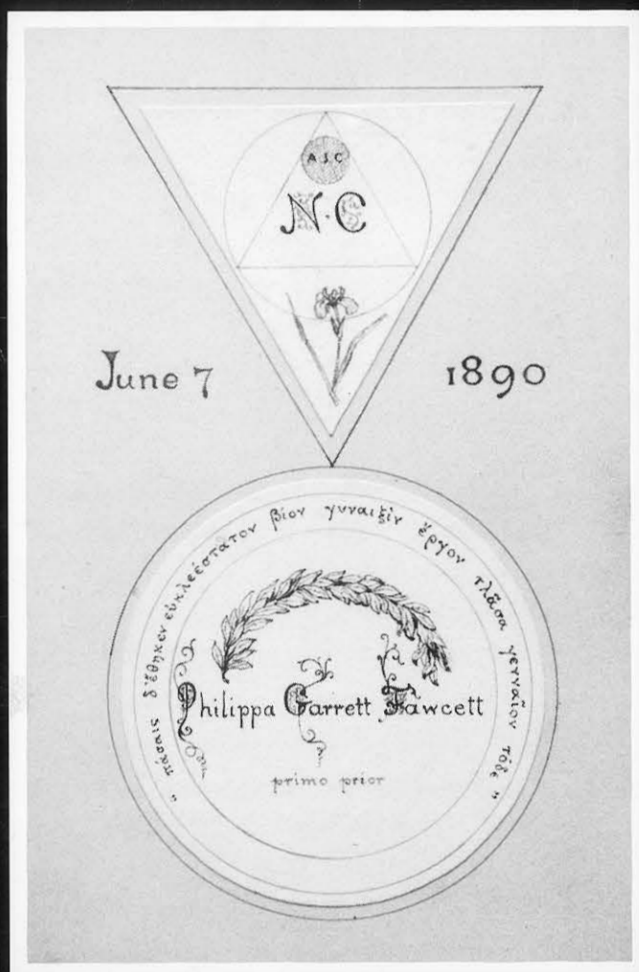
October Term, 1890.

On Nov. 27 M^{lle} Nathalie Janotta kindly gave a pianoforte recital in Clough Hall in honour of P. G. Fawcett's late success. The instrument used was a gift from the pianist to Miss Gladstone. M^{lle} Janotta stayed in Sidgwick Hall.

In the Long Vacation, in consequence of a petition from the residents in Sidgwick Hall, an efficient supply of hot water was for the first time provided in the bathrooms.

Another step towards a much desired improvement was gained about the same date. Permission was granted to bring forward a petition to the magistrates on October 24 to close to the public the road running between Old Hall and Sidgwick Clough Halls.

Although we unfortunately lost the Fives Cup to St.



Newnham College Cambridge

June 1990