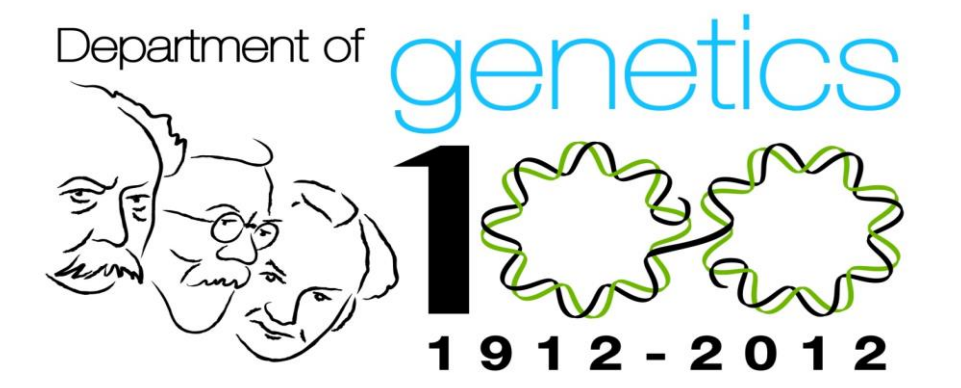




The Balfour Biological Laboratory for Women, 1884 - 1915



If admission to lectures at Cambridge was never guaranteed for women in the 1880s, gaining access to the necessary Practicals was almost impossible. There was greater justification in the exclusion of women from labs than from lecture rooms, since there was insufficient space even for male undergraduates as increasing numbers studied science. The Principals of Newnham and Girton had to pitch for each individual place. Thus, although women might be allowed to sit Tripos examinations, and if fortunate be admitted to all the necessary lectures, without having performed the experiments required, they were at a considerable disadvantage. Newnham College acknowledged early on that it must raise the finance for the resources its students needed rather than rely on the University to grant access—such as lecture rooms, a library, and laboratories.

The Balfour Biological Laboratory for Women played a critical role in ensuring women at Cambridge received the same top-level education in the Natural Sciences as men in the late C19 and early C20.

Edith Saunders was lucky enough to come up to Cambridge a few months after the Lab opened in spring 1884 - She was thus closely involved with it almost from its inception to its effectual closure for teaching in 1915, progressing through it as a Tripos student, a research student, a demonstrator, a lecturer, up to 'Head Demonstrator with charge of the Balfour Laboratory'.

Newnham students were encouraged to study science. A laboratory building was erected in its grounds in 1879, only 4 years after the College had moved to the Newnham Hall Site. Within another 4 years, with demand increasing, it was clear this provision was already inadequate. Through her Balfour family connections, Vice-Principal Eleanor Sidgwick raised funds to secure a second building where women could undertake practical work. About £200 of this was contributed by students themselves. A redundant dissenting chapel in the centre of Cambridge was bought for around £1,400. When the Lab opened to students for Easter Term 1884, the facility was named for Francis Balfour [Eleanor Sidgwick's brother], who had recently been killed in an accident, only weeks after becoming Professor of Morphology. Balfour had been a member of the Committee negotiating to secure the building, and an advocate for women's education.

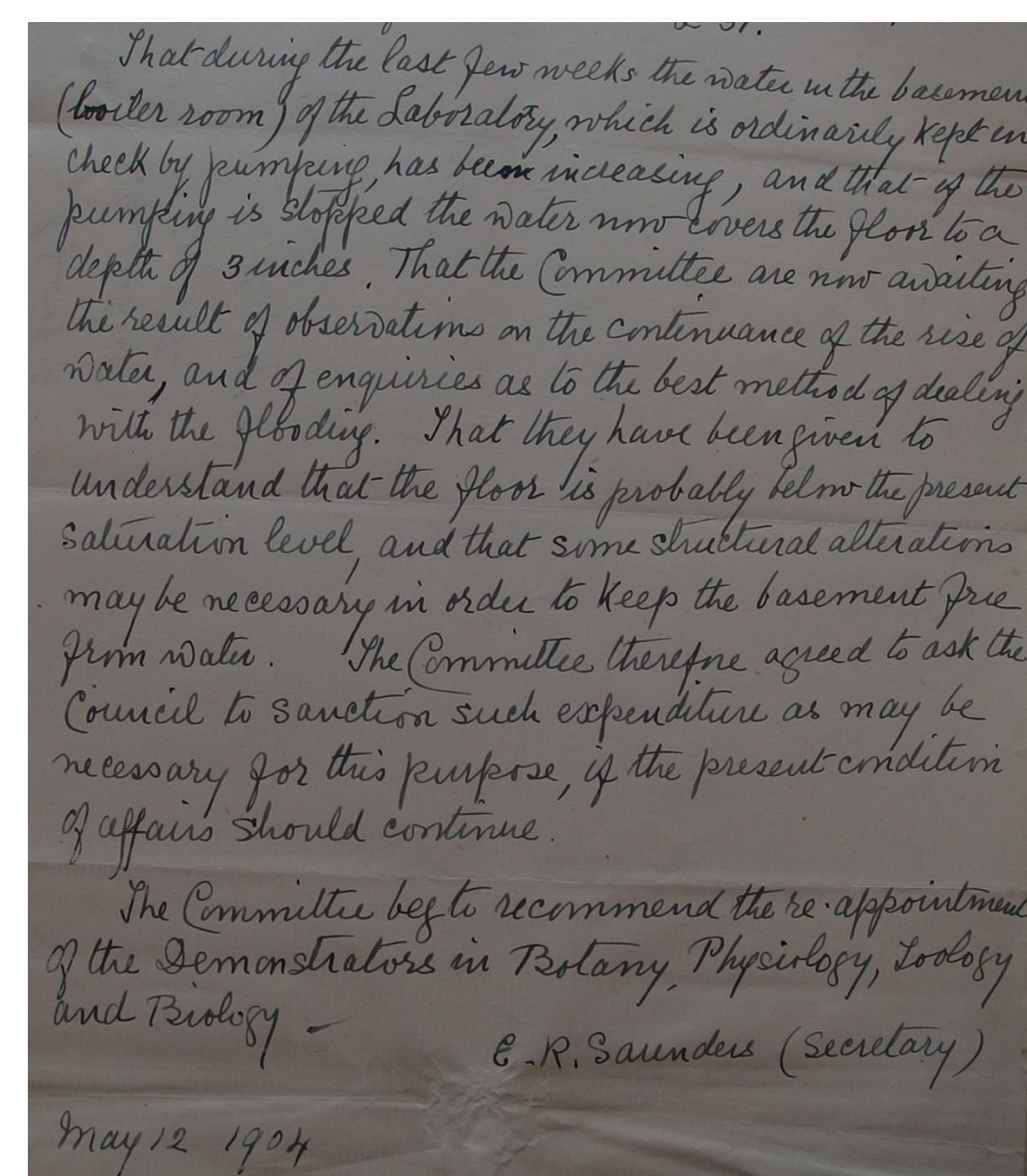
A bucolic grouping of Newnham staff in 1896, showing Marian Greenwood second from left – she was then Director of the Balfour Lab. Edith Saunders stands on the far right. She was at the time demonstrating and lecturing in botany and elementary biology. The building in the background is the original purpose-built lab in Newnham grounds, by then used for chemistry only.



Stripping the chapel and equipping the lab was managed with limited resources. Volunteers pitched in, the chapel fittings were repurposed, 'friends' donated equipment. The students' fees [initially £3 per term, soon rising to £4] were supplemented over the years with grants for additional equipment and facilities, or emergency repairs. Newnham owned the building and provided the staff, but there were enough places for both Newnham and Girton women.

When it opened, the Lab had only 2 members of staff, both recent graduates. With few women as yet sitting Tripos exams, there was only a small pool of 'graduates' to draw from. The first Director was Alice Johnson, who had studied Morphology, though only sat Part I exams. Her 'staff' consisted only of Marion Greenwood, who taught her specialist subject Physiology, and of necessity Botany, because although the University had just built a Botany Lab, Prof Vines insisted there was no space for women. Thus in 1886 two women were added to assist with Botany as it became more popular – one of these was Anna Bateson. The Lab also appears to have had only one 'boy' to assist with all the preparations needed to set up experiments. In 1890 Marion Greenwood took over the job of Director. She shouldered an incredibly onerous teaching, demonstrating and admin burden for 9 years, as well as continuing her research. The achievements of the Balfour Lab staff are especially remarkable considering none of them was a member of a University Department. They had little contact with the main body of University lecturers, and almost no support, yet they were supervising experiments following on from subjects taught in lectures, or were themselves teaching to the level required by exams, even 'coaching' students whose background in science when they came up to Cambridge was incomplete.

A mis-dated Lab report [Nov 1887 but likely 1889] recommended that the post of Demonstrator in Botany, taking over all teaching in the subject, be offered to Miss E R Saunders, at a salary of £100 per year. **'They have reason to believe that her knowledge of the subject and her power of teaching both such as to fit her for the part'.** She had been researching in the Lab thanks to a Bathurst Scholarship, and was now employed to take some of the burden off Johnson and Greenwood, the inference being that no-one else at her level had until then been available. Saunders was eminently equipped to teach the subject, because at that time the main emphasis in the teaching of Botany was plant physiology – She had been awarded the equivalent of a First Class Degree in Physiology, and had also attended Botany lectures.



Edith Saunders reports the flooding problem in the Lab basement in 1904

Saunders and Greenwood were already friends but now became teaching colleagues at the Lab for over a decade. Edith Saunders' obituary of Greenwood/Bidder reveals that after lunch they sometimes played whist, or – somewhat adventurously – battledore and shuttlecock, avoiding stove, tables and chairs.

'Miss Saunders played a leading part in organising the teaching of biological sciences for both Newnham and Girton. She cherished many happy memories of those strenuous early days, when much work had to be done with very inadequate facilities, but when, also, the thought that in learning to appreciate and add to scientific knowledge women were penetrating into a new world provided the stimulus which enabled her and her colleagues triumphantly to overcome all their difficulties' [Clapham Gilson & Godwin obituary]



Edith Saunders was a demanding but inspiring teacher. The number of students signing up for Botany rose steadily over the years and there were always considerably more women studying Botany than other subjects. But this was not only because it was considered 'suitable' for women. Harry Godwin explains:

'... during the opening decades of this [ie 20th] century, botany was particularly well served by an abundance of able women scientists. ...In girls' schools ... botany was taught to serve the need now being accepted, to import science teaching into the curriculum: Botany was less demanding of laboratory space and technical assistance than the physical sciences and more readily acceptable than zoology with its daunting dissections ... Botany went a good way towards eliciting major biological principles, not least those of reproduction; gave familiarity with the techniques of comparative morphology and elementary physiology; and offered some familiarity with what is implied by adaptation and by evolution Many able women pursued further botanical studies in the universities.' [Cambridge and Clare]

By 1893, Edith Saunders was demonstrating in Practicals in Elementary Botany and Advanced Botany, linked to A C Seward's and Francis Darwin's lectures, but she was also delivering lectures herself in Systematic Botany. She was awarded a £150 salary 'in recognition of the laborious character of the work involved'. When Marion Greenwood almost inevitably resigned in 1899, consequent on her marriage to G P Bidder, the Committee recommended that Miss Saunders be appointed 'Head Demonstrator with charge of the Balfour Laboratory', with her salary being raised to £170.

A bust of Francis Balfour overlooks the Lab



The Lab Committee's records show how it reacted to changing needs, picking up or dropping different subjects, and adjusting staff provision, depending on whether women had access to University Practicals or lectures. There was not always a steady progress. For example, after the Degrees for Women Memorial was rejected by the Senate in May 1897, there was an additional blow for women when they were refused entry to lectures they had formerly attended. The Lab had suddenly to provide lectures as well as Practicals in subjects such as Morphology which had previously been available to women. By 1910, two contiguous buildings had been acquired. A lecture room, a greenhouse, and space for histology and 'coaching' were available, as well as labs on two floors. Of major importance was the area allocated for independent research, when women had almost no hope of finding bench space in any of the University departments. Edith Saunders was able to undertake in the Lab the research which resulted in her first published paper 'On the structure & function of the septal glands in *Kniphofia*' [1890]

By 1914 women were mostly being admitted to University lectures and Practicals. Edith Saunders' demonstrations in Elementary Botany and Vegetable Biology, as well as her lectures and demonstrations in Systematic Botany were discontinued at the Lab. She was still Director when the Balfour Lab closed for teaching in 1915. While it existed it had become a uniquely supportive place for women to work, and supplemented their education where it was lacking. Subsequently, women unfortunately often found themselves resented, even obstructed, by male Undergraduates in the University labs.

The Balfour Lab building still exists in its central Cambridge location, next to the back of Wetherspoons

