

POUNDING ON THE DOORS: THE FIGHT FOR ACCEPTANCE OF BRITISH WOMEN CHEMISTS

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These days we take for granted that scientific organizations are open to both men and women, but this was not always the case (1). It is hard to realize that the admission of women chemists to chemical organizations was once a contentious issue. For example, in 1880, the American Chemical Society even held a formal Misogynist Dinner (2).

During the nineteenth and early twentieth centuries in the United Kingdom, there were many organizations that catered to the professional and social needs of chemists, the two aspects overlapping in the male club culture of the time (3). Each society treated the problem of the admission of women in a different way. In this essay, we will focus particularly on the lives of the British women who led the fight for professional acceptance. We will see that the paths of many of these women intersected and that, in fact, there must have been networking among them. The saga begins with the London Chemical Society.

The London Chemical Society

Events started promisingly for women. The London Chemical Society seemed to take pleasure in noting that women had participated in its events. At a pre-inaugural lecture of October 7, 1824, it was reported that (4):

Several ladies were present, taking a warm interest in all that was said, encouraging the lecturer by their smiles, and ensuring order and decorum by their presence.

At the subsequent inaugural lecture, it was mentioned that among the 300 persons attending, there were "a great many ladies." The address was given by Dr. Birkbeck, who specifically welcomed the participation of women (5):

It may not be out of place here to state, that chemistry is not only intended to be confined to learned men but not even to men exclusively. Hitherto, ladies have conferred the honour of their presence upon all our public proceedings; and we are extremely desirous, although it is not consistent with the present constitution of the Society, that they should hereafter become participators also, as members.

Birkbeck continued by pointing out the contributions from the late eighteenth century of the British woman chemist Elizabeth Fulhame (6) and of Jane Marcet (7), the author of a famous chemistry textbook. It is not noted whether the society did, in fact, change its constitution to allow women to be formally admitted. Unfortunately, the London Chemical Society ceased to exist shortly afterwards.

Society for Analytical Chemistry

Women gained admittance to the Society for Public Analysts (later called the Society for Analytical Chemistry) without any problem. In 1879, five years after the founding of the organization, the comment was made in the society journal, *The Analyst*, that (8):

We are liberal enough to say that we would welcome to our ranks any lady who had the courage to brave several years' training in a laboratory

However, we were unable to find any evidence of women members in the 19th century. It was not until the 1920s that significant numbers of women started to join the society as a result of their entry into analytical positions in industry and government (9).

The Royal Institute of Chemistry

The entry of women into the Institute of Chemistry (later the Royal Institute of Chemistry) can best be regarded as accidental. The institute had been founded in 1877 and the successful sitting of an examination was a prerequisite for admission. In November 1888, the Council recorded a minute noting that they did not contemplate the admission of women candidates to the examinations (10). Nevertheless, it was only four years later that Emily Lloyd became the first woman Associate.

Emily Jane Lloyd (11) had applied to sit the Associateship examination in 1892. Probably through oversight, she was permitted to sit the examination, which she duly passed. Having sat and passed the exam, the institute had no means of denying her admission. And once one woman had been admitted, there was no feasible route of barring subsequent women applicants. Having gained her associateship, Lloyd applied to the institute to take the required examination to qualify as a public analyst. Lacking any excuse to refuse her, the institute admitted her to that examination, which she also passed.

The first woman fellow was to follow almost immediately after Lloyd. This was Lucy Everest Boole, one of five children (all daughters) of the famous mathematician, George Boole (12). However, it was not until after World War I that women started to enter the institute on a steady basis. The numbers of women fellows and associates rose from 5 in 1914 to 49 in 1918 to 167 in 1927 (13).

The Pharmaceutical Society

From its foundation in 1841, the Pharmaceutical Society permitted women to take its examinations—but not attend classes or laboratories (14). Nevertheless, women did pass the exams and become practicing pharmaceutical chemists. It was Membership of the Pharmaceutical Society that presented the challenge. Most of the members saw the society as a male club. The first woman to apply was Elizabeth Leech, an experienced pharmacist. Her application in 1869 was rejected by a majority of members.

If the membership thought that the issue was now put to rest, the election of Manchester resident Robert Hampson and two of his friends to the conservative London-based Council of the Society was to change their view. Hampson was a progressive on many issues but especially that of the admission of women, a cause that he pursued with vigor. He argued that it was the duty of the society to elect all qualified persons, irrespective of gender. The battle for women's membership was fought between 1875 and 1879. Each year Hampson raised the matter at the annual meeting and each time the matter was referred back to the council. Finally, in 1878, the following motion was debated (14):

That in the opinion of this meeting it is not considered either necessary or desirable that ladies should be admitted as members, associates, apprentices or students of this Society.

It was initially announced that the motion had passed by a vote of 59 to 57, but two days later it was discovered that a mistake had been made in the count and that the motion had failed by 57 to 59.

Emboldened by the failure of the motion, Hampson moved that Isabella Skinner Clarke, who had applied for membership, should be elected. However, his efforts were unsuccessful with a tie vote resulting in the chair's casting the deciding vote against her admission. At the annual meeting in 1879, the matter of women's admission was again raised and subsequently rejected by a narrow margin. Later in the year, the indefatigable Mr. Hampson again moved the election of Clarke, together with that of another pharmaceutical chemist, Rose Coombes Minshull. This time his efforts were successful and the motion passed. With their election, the acceptance of women became an irreversible fact.

The election of Clarke and Minshull had a domino effect on the admission to the society's School of Pharmacy. Women were soon admitted to the practical classes and were at last allowed to compete for the school's medals and prizes for outstanding performance. In 1887, the second woman to receive an award for excellence from the society was Lucy Boole (15).

Pharmacy became a popular career choice for women chemists, though having a formal qualification did not end the prejudice against women. The few male pharmacy owners who would accept women employees rarely allowed them to serve at the counter, for dispensing was perceived as requiring a competent male figure. Women pharmacists were usually paid significantly less than their male counterparts. It was as a re-

sult of the continuing barriers against women that another of the pioneers, Margaret Buchanan, and some of her friends organized the Association of Women Pharmacists with Isabella Clarke becoming the first president. This organization continues to the present day as a voice for women in the profession of pharmacy.

University Chemical Societies: Oxford versus Cambridge

Each university had its own chemical society, and the society attitudes toward women members differed considerably from university to university. At Oxford University, the chemical society was known as the Alembic Club. It was divided into a Senior Club for graduates and faculty, and a Junior Club for undergraduates. Both clubs held occasional open meetings, but in addition weekly members-only seminars. These seminars were a focus of the life of the chemistry department. In 1932, the fourth year of her undergraduate tenure, Dorothy Hodgkin discovered the existence of these meetings and that she, being a woman, was excluded from them (16). This particularly rankled her when her supervisor presented her own research to a meeting from which she was barred.

The situation was no better when Hodgkin returned to Oxford as a fellow and tutor. The Senior Alembic Club ignored her existence. On one occasion, she arrived early for an open session of the club and entered the room while the closed session was still in progress. One of the members lifted her off the ground and bodily ejected her from the room. It was not until 1950 that the club voted to admit women as members.

By contrast, the Chemical Club of Cambridge University (17) seemed to have accepted women members without comment. In fact, two of them, Ida Freund (18) and M. Beatrice Thomas (19), presented research papers at a meeting in 1904. It is not surprising that they were welcomed as speakers, for these two women were influential figures in chemistry in their respective Cambridge women's colleges of Newnham and Girton.

The Liverpool University Chemical Society

Though few detailed records of student chemical societies seem to have survived, those at Liverpool University (L.U.) provide a glimpse of the effect of the arrival of women chemistry students on the male student culture. The L.U. Chemical Society was founded in 1892

(20), and the social life of the society focussed on the men-only annual dinner and annual kneipe (beer party). The latter event was an evening spent in drinking beer, smoking, singing songs, and telling stories.

In 1902 the L.U. women chemists petitioned to join the society. The petition was rejected, and women were officially barred from membership. In response, the women promptly organized their own Women's Chemical Society. The admission of women to the L.U. Chemical Society was raised in a subsequent year (probably 1908), but again without success. It was not until 1912 that women were finally admitted, and a society dance was instituted. In 1914, members heard their first woman speaker, Dorothy Baylis, one of the graduating class. The same year, the men-only kneipe was dropped and a (presumably co-educational) smoking concert took its place. For those males who still abhorred the presence of women, there was the refuge of the Research Men's Club (21).

Membership did not result in equality for women. The woman author of a cutting letter to the *L.U. Chem. Soc. Magazine* in 1922 commented (22):

Lady Chemists are overwhelmed by the extreme courtesy paid to them at Chem. Soc. teas. To the Victorian male mind, they still serve as Hewers of Bread and Drawers of Tea.

In 1928, the *L.U. Chem. Soc. Magazine* carried an article on "Women and Chemistry." In it, the anonymous author commented that (23):

I often wonder why women take up chemistry. Can it be that they imagine they will become chemists? I shudder at the thought. ... Women in the right setting are delightful creatures. A chemistry laboratory is not the right setting. A woman in a lab is as incongruous as a man at an afternoon tea party. ... If it is impossible to have a special "female" lab, then let the flapper vote give England a women's University.

This article provoked an immediate response from a woman chemistry student, defending the presence of women in chemistry (24):

Life at a University offers many attractions, not the least of which is, that should she find after many years that she is a superfluous woman she will always have a university training, and perhaps a degree, which are useful sorts of things to have when one is thinking of earning one's living. Besides, Chemistry offers so many more possibilities than Arts. Engineering would, of course, be the ideal faculty for this attractive woman, but—it simply isn't done!!

In the closing remarks, she referred to men "... who would label their doors 'No Admittance to Women.'"

Though the previous writer seemed to accept that a degree was a "back-up plan" in the event of failure to marry, the next issue carried a rebuttal with a more strongly feminist stance (25):

The author [of the attack on women chemists] seems to forget that we are now living in the 20th century, when that which used to be a "man's job" is a man's job no longer. In almost every occupation women are equalling [*sic*] and have equalled [*sic*] men. ... He evidently does not know that darned socks and rocking cradles went out with crinolines. ...

Then, however, the author realistically adds:

Women and men meet on equal terms and work on equal terms. At night, the man goes home to be waited on, while a woman goes home to do a "woman's job."

This third contribution seemed to end the correspondence, but the exchange clearly indicates the degree of hostility facing women students from some of their male chemistry colleagues.

The Biochemical Society

The Biochemical Club, as it was first called, was founded in 1911. At the first meeting the second item on the agenda concerned the admission of women (26). A letter had been received from "a lady" (probably Ida Smedley) requesting permission to become a charter member. An amendment was therefore proposed to the rules that only men were eligible for membership. The amendment passed by a vote of 17 to 9. This vote was challenged; and at a committee meeting the following year, the club reversed its position, voting by 24 to 7 that women be admitted. In 1913, the club held its first meeting to elect new members and of the seven admitted, three were women: Ida Smedley (27), Harriette Chick (28), and Muriel Wheldale (29). Fourteen years later, Smedley became the first woman chairman of the club.

The Chemical Society

The Chemical Society was founded in 1841, but it was not until 1880 that the question was raised of the admission of women. This convoluted saga, which has been described in detail by Mason (30), lasted 40 years. In the initial discussion legal opinion was given that, under the charter of the society, women were admissible as fellows. However, a motion was defeated that pro-

posed a clarification in the by-laws, so that any reference to the masculine gender should be assumed to include the feminine gender. A similar proposal in 1888 was also rejected.

The first attempt by a woman (possibly Emily Lloyd or Lucy Boole) to enter the society occurred in November 1892. The long controversy started innocuously, as the Minutes of the Council meetings describe (31):

The Secretary having read a letter from Prof. Hartley suggesting the election of a lady as Associate, Prof. Ramsay gave notice that he would move that women be admitted Fellows of the Society.

William Ramsay was one of the most consistent supporters of the admission of women. He practiced what he preached, taking on a significant number of women research students (32). His outspoken foe on this issue was Henry Armstrong, who viewed the Chemical Society as a male preserve. His opposition to women members stemmed from his belief that women should be home producing future generations of chemists (33):

If there be any truth in the doctrine of hereditary genius, the very women who have shown their ability as chemists should be withdrawn from the temptation to become absorbed in the work, for fear of sacrificing their womanhood; they are those who should be regarded as chosen people, as destined to be the mothers of future chemists of ability.

He fostered this philosophy by organizing a Chemical Club, along the lines of a traditional men's club, which the councilors of the Chemical Society were invited to attend (34).

Ramsay's motion came to a vote the following January. An amendment was proposed that it was not desirable at that time to amend the by-laws for the purpose of admitting women. The amendment was defeated by 7 to 6; then, curiously, the motion itself was defeated by a margin of 8 to 7. The Secretary commented (31):

... the general feeling being that although there was no objection in principle to the admission of women as Fellows, the case in their favour was not entirely established.

So things remained until 1904, when Marie Curie's name was put forward for election as a foreign fellow (30). At the following meeting (30), discussion of her candidacy resulted in a motion once again to request the opinion of legal council on the eligibility of women for admission as ordinary fellows and foreign members. Presumably the opinion of 24 years earlier had been forgotten, or it was hoped that a new counsel would offer a different opinion. This was, in fact, the case. The new

counsel argued that women could be elected as foreign members without difficulty, but that the election of British women would require a supplemental charter for the society. However, counsel expected that such a supplemental charter would be granted, once approved by the society (30). Curie was duly elected; and, emboldened by Curie's success, 19 women appended their names to a petition for admission of women to fellowship (35). In this appeal, the petition authors noted the increasing contributions of women chemists and the willingness of the Chemical Society to publish their results.

The 1904 Women Petitioners

It is the identity of these 19 women, and the factors that they had in common, that we found most interesting. What common bonds did these women have that brought them into contact over this issue? There must have been extensive communication in order to produce the signed petition. The research to find the links necessitated visits to many archives. Some of the individuals left very clear trails of their life and work. In fact, a few became quite well known in their respective fields. Others had contributed briefly to the chemical progress of their times, authored some papers, and then vanished without a trace. Nevertheless, we were able, with some degree of confidence, to deduce how most of their paths crossed.

The first introduction of each petitioner's name will be in bold and we will provide a brief synopsis of the movements of each one up to the 1904 petition. In this way the reader can appreciate how most of the women moved back and forth between a small number of institutions, meeting other women chemists in the process. We contend it was through this building of networks between women chemists that the 19 petitioners became acquainted.

First, there seem to have been two leading figures in the endeavor, the biochemist, **Ida Smedley** (Mrs. Maclean) and the organic chemist, **Martha Annie Whiteley**. Smedley, mentioned earlier in the context of the Biochemical Club, had attended King Edward VI (KEVI) High School for Girls in Birmingham before proceeding to Newnham College, Cambridge, where she completed the degree requirements in 1899 (though women were not formally granted undergraduate degrees at Cambridge until 1948 (36)). She then became a research student with Henry Armstrong at the Central Technical College, London (later part of Imperial College). It is interesting that Armstrong, who believed so

strongly in women's "traditional roles," should have taken on such an outspoken advocate of women's rights. Smedley spent 1903 back at Newnham and then in 1904, the petition year, took up a research position at the Royal Institution, London.

Smedley's longtime friend, Martha Whiteley (37), graduated from the Royal Holloway College, one of the two women's colleges of London University, with a degree in chemistry in 1890. During the 1898-1902 period, she was undertaking research at the Royal College of Science, London (later part of Imperial College). It is during this time that Whiteley and Smedley almost certainly met. In 1903 Whiteley was invited to join the staff of Imperial College. She, too, was a strong advocate for women chemists, persuading Professor Thorpe to set aside two to three places in his research laboratory specifically for women (38).

King Edward VI High School

As mentioned above, Smedley had attended the KEVI High School in Birmingham. It is amazing how many women chemists and biochemists were trained at this one school (39). In the context of the petition, we know that Smedley had become friends with the petitioner, **M. Beatrice Thomas** (19)—one of the first women speakers to the Cambridge Chemical Club—during their time together at KEVI. Thomas, like Smedley, proceeded to Newnham College. Following graduation in 1898, she was a demonstrator in chemistry at the Royal Holloway College for two years and then held a scholarship at the University of Birmingham for the following year. From 1902 to 1906, she was a demonstrator in chemistry at Girton College of Cambridge University.

Hilda Jane Hartle (40), another petitioner, was also a contemporary of Thomas and Smedley at KEVI. After graduating from Newnham College, she became a researcher with Percy Frankland at the University of Birmingham from 1901 to 1903. In 1903 she returned to the city of Cambridge, having been appointed lecturer at Homerton College.

Newnham College

Newnham College, the "science" women's college of Cambridge University, provides a second node among the petitioners. Smedley, Thomas, and Hartle were there about the same time. Another signatory from Cambridge was **Ida Freund**, the other pioneering woman speaker

at the Chemistry Club at Cambridge University. Freund was a demonstrator, then a lecturer, in chemistry at Newnham from 1887 through 1912 (19), so she would have been a mentor to all of the petitioners who passed through the gates of Newnham.

Elizabeth Eleanor Field (32) graduated from Newnham in 1888 and then stayed on at least two more years as a research student. After teaching for two years at the Liverpool School for Girls, she held the post of Lecturer and Head of Chemistry at the Royal Holloway College from 1895 to 1913.

Dorothy Blanche Louisa Marshall (32) arrived at Cambridge in 1896. Following a one-year demonstratorship at Newnham College, she held an appointment as lecturer at Girton College until 1906. When she first took up her post at Girton College, Thomas was initially an assistant demonstrator with Marshall. Marshall had gained her undergraduate degree at Bedford College, the other women's college of the University of London. Following her graduation in 1891, she undertook research, part of which was supervised by Sir William Ramsay.

Mildred May Gostling (32) was yet another petitioner who spent time at Newnham, in her case, the 1899-1900 year as a research student. Gostling, daughter of the chemist George James Gostling, obtained her degree from the Royal Holloway College in 1897 where she had almost certainly been taught by Field. In 1901 she returned to the Royal Holloway College to take up the position of demonstrator, resigning from her position in 1903 when she married the chemist William Hobson Mills.

Royal Holloway College

The third node seems to have been the Royal Holloway College (RHC). Of those already mentioned, Thomas, Field, Whiteley, and Gostling spent time there. In addition, there were two other petitioners from the RHC: **Margaret Seward** (Mrs. McKillop) and **Sibyl Taite Widdows**.

Seward (32), the only petitioner to have taken her undergraduate studies at Oxford, was Lecturer in Chemistry at the RHC from 1887 until her marriage to John McKillop in 1891. She resumed academic life in 1896, taking a position in the Women's Department of King's College, of London University. She may have retained links with the women at the RHC or alternatively, she

may have developed friendships with women chemists of Ramsay's group at nearby University College (see below).

Widdows (41) had several links with the other petitioners. She graduated from RHC about 1900, then became a demonstrator in chemistry at the London School of Medicine for Women. During her time at the school she published numerous research papers. Of particular note, the second of her publications was co-authored with Mills, spouse of Gostling, and the third with Smedley, providing clear evidence of links with these two individuals.

The Ladies' College, Cheltenham

Two signatories, **Clare de Brereton Evans** and **Millicent Taylor**, obtained external (London) degrees from the Ladies' College, Cheltenham; and their times at the college overlapped. Evans (32) graduated in 1889 and eight years later was awarded a D.Sc. from the Central Technical College (the first woman chemist to receive this distinction). Smedley also attended the Central Technical College though at a later date, but it is conceivable that they became acquainted there. In 1898, Evans became lecturer at the London School of Medicine for Women (42). However, part of her time must have been spent doing research at University College, London, for it is from that address that two papers appeared under her name in 1908. One of these describes her attempt to separate an unidentified element from iron residues supplied by Ramsay.

Taylor (43) graduated from the Ladies' College in 1893. She was appointed to the staff at the college but spent all her spare time doing research at the University College of Bristol (later the University of Bristol). This involved cycling an 80-mile round trip at least once per week. She received an M.Sc. from Bristol in 1910 and a D.Sc. in 1911.

The University of Bristol

Taylor was not the only signatory linked with the University of Bristol. **Emily Comber Fortey** (32) graduated from the University College of Bristol in 1896. She undertook research at Owens College, Manchester until 1898 at which point she returned to Bristol as a researcher with Sydney Young. **Katherine Isabella Williams** (32) also spent time at Bristol but long before that of Taylor and Fortey. Williams had also been a high

school student at KEVI, though her graduation from there predated that of the other KEVI petitioners. In the 1880s she commenced research with Ramsay who was then at Bristol (prior to his move to University College, London). Then she embarked upon her own research program at Bristol in food analysis. As Taylor, Fortey, and Williams were all researchers at Bristol at the same time, it is almost certain they were mutually acquainted.

The London School of Medicine for Women

Three of the petitioners had links with the London School of Medicine for Women (LSMW). Besides Evans and Widdows, already mentioned, the third individual was **Lucy Everest Boole**. She has been discussed in the context of being the first woman chemist to be elected Fellow of the Institute of Chemistry (32). She was the only one of the petitioners not holding a formal degree. Instead, Boole had completed the program at the School of the Pharmaceutical Society (as previously noted). In 1891 she was appointed demonstrator and then lecturer at the LSMW. Unfortunately, ill health resulted in her resignation. However, to keep her, the Council of the school divided the position and appointed her teacher of practical chemistry. It was Evans who succeeded Boole, and then Widdows was hired about two years later. At the time the petition was signed, all three were at the school, providing one of the most solid links among petitioners.

Ramsay's Research Group at University College, London

We had mentioned earlier that William Ramsay was a strong supporter of the rights of women chemists. Emily Aston, the first British woman chemist to publish prolifically, undertook research with Ramsay between 1893 and 1902, at which point she "disappeared" from the records. Three other members of Ramsay's group have been listed above as petitioners: Williams, Marshall, and Evans. Williams worked with Ramsay before his move to University College, while Marshall had already departed for Girton College, Cambridge. However, Evans was with Ramsay at the time of the petition collection, as was **Katherine Alice Burke**. Burke (44) obtained her degree from Birkbeck College, another constituent college of the University of London. Upon graduation, she joined Ramsay's research group at University College. Burke and Evans obviously knew each other, for Evans noted on one of her publications that she thanked Burke for help with her (Evans') analytical measure-

ments (45). Evans was clearly the link between the women at University College and those at the LSMW.

The University of Birmingham

Though the women who originated from KEVI School, Birmingham, proceeded on the well-trod path to Newnham College, Cambridge, there were some women chemists at Mason College, Birmingham (later the University of Birmingham). Thomas was at Birmingham for the 1901-02 year, while Hartle was there from 1901 to 1903. Another signatory at Birmingham was **Grace Coleridge Toynbee**. Toynbee (32) spent a year at Bedford College and then studied in Germany before marrying the chemist Percy Frankland in 1892. In 1894 the Franklands moved to Birmingham, where Frankland had been appointed professor of chemistry at Mason College. It was possibly through Hartle that Toynbee learned of the petition document.

The Other Signatories

Finally, there were two petitioners who were not part of any of these circles: **Edith Ellen Humphrey and Alice Emily Smith**. Humphrey (46) graduated in 1897 from Bedford College and the following year moved to Zürich where she undertook a Ph.D. with Alfred Werner. No clear connection between Humphrey and any other signer has been found.

Smith (47) was the other enigmatic case. A graduate of the University College of North Wales, Bangor, she undertook research from 1901 to 1903 at Owens College, Manchester. In 1903 Smith returned to Bangor as lecturer in chemistry, where she collaborated on a study of reaction mechanisms with K. J. P. Orton. Again it is difficult to find any period of overlap with another petitioner. Of course, we have been assuming that all the links were through other women chemists. It may have been that "women-friendly" male chemists conveyed the news of the petition to women chemists on the periphery. Individuals who may have served in this role were Ramsay, Mills, Perkins, or Frankland. In the case of Smith, it may have been Orton who was the source of news of the petition, for Orton was a strong supporter of women chemists.

The Links

We have described how the petitioning women moved between quite a small number of locations. The links

that we have identified are shown in the Table below. It is immediately apparent that the petitioners resided in one (or more) of four cities: Cambridge, London, Bristol, and Birmingham. It is unlikely that we will ever be able to deduce how word of the petition was disseminated from one node to another, but we can see the foci and identify the individuals who had contact between those centers. Thus we have strong though circumstantial evidence of networking among the women chemists of the time.

the society (30). William Tilden, President of the Chemical Society at the time, and a strong supporter of women's admission, proposed another tack. He circulated a petition in support of women's admission, signed by 312 of the most distinguished fellows of the society. Then in 1908 he co-sponsored a motion that there be a ballot of members on the issue. This passed, and a ballot was circulated, accompanied by a list with six reasons to vote for admission and seven reasons to deny admission. With a vote of 63% in favor, it might naively be assumed that the battle was won. However, at the December 3, 1908 council meeting, an amendment

Table. The signatories of the 1904 petition for the admission of women to the Chemical Society and institutions where they overlapped up to that date.

Name	U. Cambridge	U. London	U. Bristol	Other
Lucy Boole	-	-	-	LSMW
Katherine Burke	-	X	-	-
Clare de Brereton Evans	-	X	-	Cheltenham, LSMW
E. Eleanor Field	X	X	-	-
Emily Fortey	-	-	X	U. Manchester
Ida Freund	X	-	-	-
Mildred Gostling (Mrs. Mills)	X	X	-	-
Hilda Hartle	X	-	-	KEVI, U. Birmingham
Edith Humphrey	-	X	-	-
Dorothy Marshall	X	X	-	-
Margaret Seward (Mrs. McKillop)	-	X	-	-
Ida Smedley (Mrs. Maclean)	X	X	-	KEVI
Alice Smith	-	-	X	U. Manchester
Millicent Taylor	-	-	X	Cheltenham
M. Beatrice Thomas	X	X	-	KEVI, U. Birmingham
Grace Toynbee (Mrs. Frankland)	-	X	-	U. Birmingham
Martha Whiteley	-	X	-	-
Sibyl Widdows	-	X	-	LSMW
Katherine Williams.	-	X	X	KEVI

Key:

Cheltenham = Ladies' College, Cheltenham

KEVI = King Edward VI High School for Girls, Birmingham

LSMW = London School of Medicine for Women

The Effect of the Petition

Following receipt of the 1904 petition, the then (women-friendly) council unanimously adopted the proposal to alter the by-laws, but the changes had to be approved by the body of the organization. Of the over 2,700 members, only 45 attended the extraordinary general meeting to approve the changes; and, of those, 23 voted against. Thus women continued to be excluded from

was proposed by Henry Armstrong that women be granted a special subscriber status, rather than full fellowship (48). The amendment passed by a vote of 15 to 7. The passage of this reversal was prompted by the fear that the Armstrong-led minority would use legal means to block the proposed by-law.

About this time a report was circulated, claiming that the women petitioners were linked to the agitation for the political enfranchisement of women. This in-

situation that the women chemists were associated with such radical elements brought forth a rebuttal from 31 women chemists, including 14 of the original petitioners. In a letter to *Chemical News* (49), the authors noted that the sole bond between them was a common interest in chemistry. The letter was followed by a statement from the same group of women concerning a "meeting of representative women chemists." In this statement, the 312 fellows were thanked for their support; and in addition women were urged not to become subscribers on the grounds that it would prejudice their case for fellowship status in the Chemical Society. Among the names on the letter other than the 14 of the original petitioners (50), was the biochemist Frances Chick, sister of Harriette Chick, one of the three pioneering women members of the Biochemistry Club.

For the 11 years of its existence, only 11 women availed themselves of subscriber status, thus indicating a strong determination by most women that it was to be full fellowship or nothing. It was 1919 before the matter was again put before the council. This time, in the postwar era, the motion passed, and in 1920, the first women were admitted as fellows. Among the 21 women to be admitted at that auspicious first election were four of the original petitioners: Smedley, Taylor, Whiteley, and Widdows. At subsequent meetings of the society, Burke, Humphrey, and Thomas were elected. Boole, Freund, and Williams did not live to see the day of victory.

The Women Chemists' Dining Club

That women were still not fully welcomed in the Chemical Society is evidenced by the formation of The Women Chemists' Dining Club in 1925 (51). The founders of the organization were, not surprisingly, Whiteley and Smedley. The organization usually held three dinners each year with an occasional speaker or social outing. Though meetings of the club were suspended during World War II, they resumed about 1947 (52). In 1952, there were 66 members. Unfortunately, no records of the club could be traced, and its demise probably occurred sometime during the 1950s.

Commentary

In this article, we have endeavored to show the challenges that British women chemists faced in gaining acceptance by the professional societies, especially the Chemical Society. Particularly interesting is the in-

volvement of a core of active women whose later careers differed but who shared common bonds of education at a surprisingly small number of institutions, specifically KEVI High School, Newnham College, Royal Holloway College, and the University of Bristol.

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