



JEAN IRVINE AND LESLEY YELLOWLEES, FIRST FEMALE PRESIDENTS OF THE ROYAL PHARMACEUTICAL SOCIETY AND OF THE ROYAL SOCIETY OF CHEMISTRY, RESPECTIVELY

JEAN IRVINE Y LESLEY YELLOWLEES, PRIMERAS MUJERES PRESIDENTAS DE LA ROYAL PHARMACEUTICAL SOCIETY Y DE LA ROYAL SOCIETY OF CHEMISTRY, RESPECTIVAMENTE

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ABSTRACT

Despite the indisputable progress made in the fight against gender inequalities since the last years of the last century, there are still many differences between the roles played by women and men when it comes to holding the top positions on boards of directors of relevant companies or in the presidencies of scientific societies, in which the presence of women does not reach at all the percentage of 40% that is estimated as necessary to achieve that equality. In this article, we show the biographies of Jean Irvine and Lesley Yellowlees, the first female presidents of the Royal Pharmaceutical Society and the Royal Society of Chemistry, respectively, although their appointments occurred many years after the aforementioned societies had been founded. The objective is to make their figures known to society and place them as references and models to be followed by the rest of women who wish to practice a profession. Some brief biographical data of other women who played a prominent role in scientific and academic societies in the early years of the 20th century are also shown.

RESUMEN

A pesar de los indiscutibles avances habidos en la lucha contra las desigualdades de género desde los últimos años del siglo pasado, aún existen muchas diferencias entre los roles que desempeñan las mujeres y los hombres a la hora de ocupar los primeros puestos en los consejos de administración de empresas relevantes o en las presidencias de sociedades científicas, en las que la presencia de mujeres no alcanza en absoluto el porcentaje del 40% que se estima necesario para alcanzar esa igualdad. En este artículo mostramos las biografías de Jean Irvine y Lesley Yellowlees, las primeras mujeres presidentas de la Royal Pharmaceutical Society y de la Royal Society of Chemistry, respectivamente, aunque sus nombramientos se produjeron muchos años después de la fundación de dichas sociedades. El objetivo es dar a conocer sus figuras ante la sociedad y situarlas como referentes y modelos a seguir por el resto de las mujeres que deseen ejercer una profesión. También se muestran algunos breves datos biográficos de otras mujeres que desempeñaron un papel destacado en sociedades científicas y académicas en los primeros años del siglo XX.

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Palabras Clave:

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1. INTRODUCCIÓN

It is clear that since the last twenty years of the last century, especially in the European and American continents, the great difference between the rights of women and those of men in many areas of life has been significantly reduced. However, this equalization has not yet been fully achieved and it is still very evident in what refers to the occupation of managerial or important positions by women in companies, educational centers and other social institutions, in which women appear in a much smaller proportion than men, which implies that this difference continues being still very remarkable.

This is the case, for example, of what happened in very relevant world scientific societies, such as The Royal Society of Chemistry, the Royal Pharmaceutical Society, or the Royal Society of London. In the first one, the first woman to become president, Lesley Yellowlees, did so in 2012, that is, almost 45 years after the society was founded, and this is without counting the previous years that passed without women in the presidencies of the different entities that constituted the germ of it.

Many years before, Jean Irvine took longer to achieve the position of president of the Royal Pharmaceutical Society, as she became president of that society in 1947, more than a century after its founding and after more than one hundred and seventy men had passed through that post.

And if we refer to the Royal Society of London, formally The Royal Society of London for Improving Natural Knowledge, the oldest and most prestigious of the scientific and academic societies in the world, which was created in 1660, it is very significant that still, nearly four and a half centuries later, no woman has held the position of president.

Moreover, not only no woman has been president of this Royal Society to date, but it also took a long time for a woman to be admitted in that institution, specifically until 1945, when Kathleen Lonsdale (1903-1971) and Marjory Stephenson (1885, 1948), x-ray crystallographer the first cited and biochemist the second, respectively, were elected to the Royal Society in that year.

According to these situations, the main objective of this article is to make Jean Irvine and Lesley Yellowlees known to society. To do so, the methodology followed has been the usual in this type of research, the search for information on both women in all kinds of sources, mainly primaries.

The structure of the article is as follows. After this introduction, Section 2 is devoted to recall the enormous difficulties that women had to be admitted at the different British scientific societies at the beginning of the 20th century and who were some of those women who dared to take that step. Next, and by way of

contextualization, Sections 3 and 4 are devoted to briefly recall the historical origins of the Royal Pharmaceutical Society and the Royal Society of Chemistry. Sections 5 and 6 show biographies of Jean Irvine and Lesley Yellowlees, respectively. Finally, a section of conclusions closes the article.

2. BACKGROUND

It has already been commented that it took a long time from their respective beginnings for the Royal Pharmaceutical Society and the Royal Society of Chemistry to allow a woman to occupy the position of president, and also that almost three and a half centuries after its foundation, no woman has still acceded to that position in the Royal Society of London.

Focusing on this last society, since the following two sections are dedicated to the first two ones mentioned, respectively, it can be indicated that although the early statutes of the society did not explicitly prohibit a woman from being appointed Fellow of the society, the fact is that this admission was for a long time of its history closed to women, due in large part to the fact that in England the access of women to studies and, therefore, to academic societies, was practically non-existent during the 17th and 18th centuries, and it was not until well into the 19th century that this situation changed, very slowly at first and then gradually consolidating. with the founding of the Zoological Society of London in 1829 (it is a global science-led conservation organization helping people and wildlife live better together to restore the wonder and diversity of life everywhere) and the Royal Entomological Society in 1833, which already allowed the admission of women to their ranks from its inception (1), (2). The foundation of this last society began with a meeting of "gentlemen and friends of entomological science", held on 3 May 1833 in the British Museum under the presidency of John George Children. There, assistants decided that a society should be convened for the promotion of the science of entomology in its various branches and it should be called the Entomological Society of London. Women were allowed membership and had the same rights as the men.

The first known incidence of the admission of women to the Royal Society took place in 1900, when Marian Sarah Ogilvie Farquharson (née Ridley, 1846-1912), a British naturalist and women's rights activist, the first woman to have been admitted as a Fellow of the Royal Microscopical Society, although she was not permitted to attend meetings, he sent a letter to the Council of the Royal Society requesting that "duly qualified women should have the advantage of full fellowship in scientific and other learned societies" (the Royal Microscopical Society was founded as "The Microscopical Society of London" in 1839 and awarded its Royal Charter in 1866).



However, the Royal Society Council did not uphold Farquharson's request, arguing that the admission of women "must depend on the interpretation to be placed upon the Royal Charters under which the Society has been governed for more than three hundred years" (1). Marian Farquharson had also sent that request to the Linnean Society of London with the same result (The Linnean Society of London had been founded in 1788 by botanist Sir James Edward Smith, taking its name from the Swedish naturalist Carl Linnaeus, the 'father of taxonomy' and later, in 1802 gained its Royal Charter and took the name of "The Linnean Society of London"). At present, more than for these requests, Marian Farquharson is best remembered by the society for her campaign of women rights to full fellowship of learned societies.

Later, when another woman, the British engineer, mathematician, physicist, and inventor Phoebe Sarah Hertha Ayrton, usually known as Hertha Ayrton (1854-1923), was nominated for fellowship of that society in 1902, her candidature was rejected for the sole reason of a married woman had no standing in law (3). Hertha Ayrton always suffered many difficulties, both in her primary and secondary studies as well as in her university career, just because she was a woman. In 1880, she passed the Tripos in Mathematics

but did not receive the degree because, at that time, Cambridge University only gave certificates, not degrees, to women. She had to pass an external examination to obtain her Bachelor of Science degree from the University of London in 1881.

In 1901, Hertha Ayrton had published *The Electric Arc*, a compendium of her previous twelve articles published between 1895 and 1896 on her analysis, research and technical advances in the field of electric arc lighting, in "The Electrician", the premier electrical engineering periodical of the age. It made that she was nominated for Fellowship of the Royal Society by the renowned electrical engineer John Perry. However, as we have just indicated, the Royal Society Council rejected her application, because "married women were ineligible for membership partners" (4).

However, the Royal Society later corrected her position somewhat and in 1904 allowed her to become the first woman to read a publication in its dependencies. The paper was entitled "The Origin and Growth of Ripple Marks", but it could not be read by her for being a woman, having to do it on her behalf who had nominated her for Fellowship, John Perry (5). That paper was later published in the Proceedings of the Royal Society.

Media in category "Female Fellows of the Royal Society"

The following 54 files are in this category, out of 54 total.

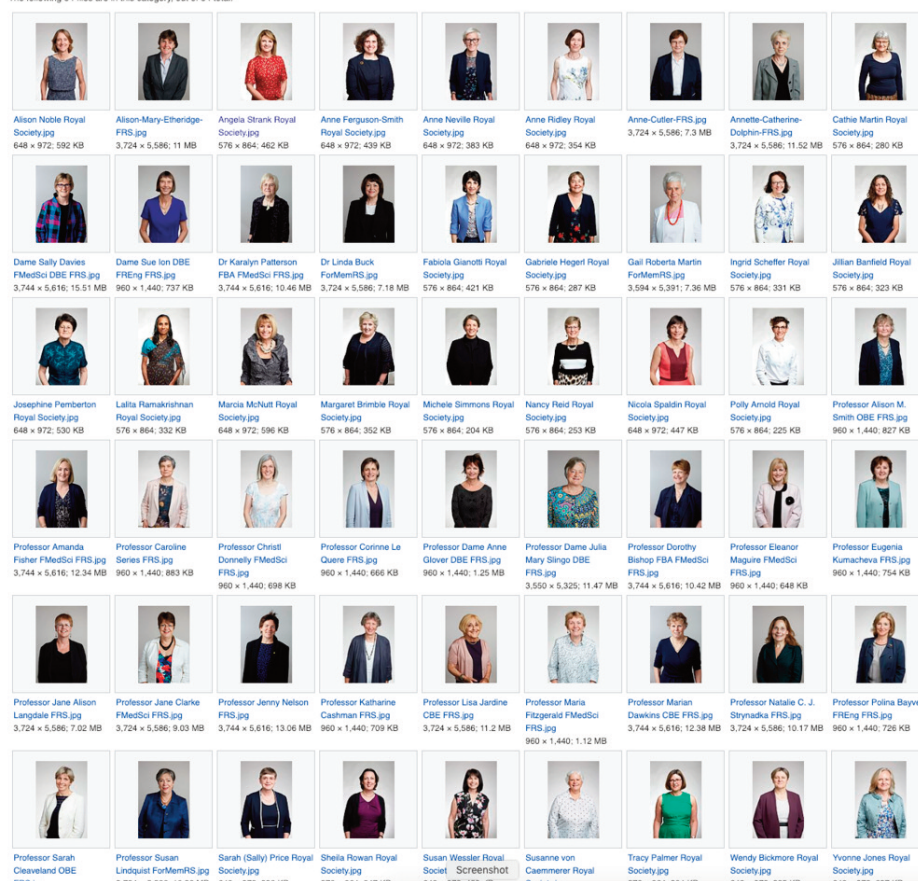


Figura 1. The list of Female Fellows of the Royal Society elected from 2014 to 2018.
Source: picture uploaded as part of the Wikiproject Royal Society (22).

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Moreover, in 1906, she was awarded the Royal Society's most prestigious award, the Hughes Medal, for "her experimental investigations on the electric arc, and also on ripples in the sand". She was the fifth person to receive that prize, awarded annually since 1902, in recognition of an original discovery in the physical sciences, particularly electricity and magnetism or their applications; and until 2013, one of only two award-winning women (5).

Hertha Ayrton was also the first woman to read her own paper in the prestigious engineering society Institution of Electrical Engineers and in 1899, was elected as a member of that institution, which was a prestigious and widely recognized professional qualification. Thus, Ayrton became the first female member of that institution and the first professionally recognized female electrical engineer.

Several years later from the rejection of Hertha Ayrton as a member by the Royal Society, the Sex Disqualification (Removal) Act 1919 considered illegal for incorporated societies to refuse admission on the grounds of an individual's sex or marital status (6). Although the Royal Society admitted the provision of section 1 of the Act in 1925, in reply to a question originally put to them by the Women's Engineering Society three years prior, it was not until 1943 that another woman was nominated for fellowship. Finally, Kathleen Lonsdale and Marjory Stephenson were duly elected in 1945, after a postal vote amending the Society's statutes to explicitly allow women fellows (7).

At present, there is a lot of information in the literature about the causes that produced the very low presence of women both in the Royal Society and in other societies and in science in general. Among them, the following publications can be consulted: (8) to (21). The list of Female Fellows of the Royal Society elected from 2014 to 2018 (22) can be seen in Figure 1.

To finish this background, we include next some brief notes related to the presence of women in the early years of Spanish scientific societies, in order to complete with data of female scientists from our country this contribution, that deals with the presence and role of women in the early years of life of these societies.

Although with some delay with respect to them, the scientific societies were founded in Spain in the image and likeness of those already existing abroad, coming from the phenomenon of scientific associationism of the European 19th century.

Among them, the one that had the greatest presence of women among its members was the Spanish Society of Physics and Chemistry, founded on January 23, 1903. In its first year it reached 263 members. In 1928, King Alfonso XIII granted it the title of "Royal" and in 1980 it was decided to split it into two branches, the Royal Spanish Society of Chemistry and the Royal Spanish Society of Physics.

The first woman who joined as a member was Martina Casiano Mayor (Madrid, 1881 - Cádiz, 1958), in 1912. She was a teacher of Higher Education since 1898 (23). And the first woman President of the Society, already in the Physics branch, was María del Rosario Heras Celemín, who held that position in the period 2010-2013, when it had already passed more than a century since its foundation. At present, María del Rosario Heras Celemín (Zamora, 1950) is a scientist, researcher and physicist, who is a pioneer in research on renewable energy and energy efficiency in buildings. She was emeritus researcher at the Center for Energy, Environmental and Technological Research and earned the 2021 National Energy and Environment Awards, delivered by the Ministry for Ecological Transition and Demographic Challenge.

Other of the Spanish scientific associations of that time were, chronologically by year of foundation, the Spanish Society of Natural History, the Spanish Association for the Progress of Sciences and the Spanish Society of Mathematics.

The (currently Royal) Spanish Society of Natural History was established in 1871 thanks to the impulse given by a group of 26 people, of whom only 3 were women (23). Until 2022, that Society has had 114 presidents, among whom there is only one woman: Isabel Rábano Gutiérrez del Arroyo, a member of the Mining and Geological Institute of Spain, who held that position between 2010 and 2013. She is a PhD in Biological Sciences from the Complutense University of Madrid and a Senior Scientist of the CSIC (on leave of absence). Since 1993, she was director of the Geomining Museum of the Geological and Mining Institute of Spain. As a scientist, she is a paleontologist specializing in Ordovician trilobites, author of numerous publications on the subject, and responsible for research projects on movable and immovable geological heritage.

The Spanish Association for the Progress of Sciences was founded at the prior request of the President of the Spanish Society of Natural History, Luis Simarro (1851-1921), and other prestigious scientists, such as José Rodríguez Carraco, Ignacio Bolívar, José Echegaray, Blas Cabrera, Julián Calleja and Leonardo Torres Quevedo, among others, to the President of the Council of Ministers Segismundo Moret (1833-1913), on January 2, 1908. From its foundation and until the beginning of the Civil War (1936) there were 38 women members. The Association's activity declined from the decade of 1950 and led to its completion in 1979, the year of the last Congress. There is no data that any woman held the presidency.

The Spanish Mathematical Society (now the Royal Spanish Mathematical Society) was founded in 1911 by a group of mathematicians, including Luis Octavio de Toledo y Zulueta (1857-1934), and Julio Rey Pastor (1888 -1962), both Professors of



Mathematical Analysis at the Central University of Madrid. One of its founders was Josefa Barrera, Castilla widow, who was a teacher at the Normal School for Teachers in Madrid. Between 1911 and 1936 there were 12 associated women (23). The first woman who presided the society reached that position a century and 5 years after its foundation, in 2006. She was Olga Gil Medrano, who remained in office for 3 years. The second woman president of the Society is who currently holds that position, Eva A. Gallardo Gutiérrez, who took office in 2022.

Olga Gil Medrano (Burgos, 1956) was also a member of the Executive Committee of the European Mathematical Society (2005-2008) and of the Scientific Committee of the Institute of Mathematics of the Polish Academy of Sciences, "Banach Center" (2006-2009). Since 2009 she is a member of the Scientific Committee of the Tbilisi International Center for Mathematics and Informatics, of the Georgian Academy of Natural Sciences. In addition to being President of the Royal Spanish Mathematical Society from 2006 to 2009, she was President of the Spanish Committee for the International Mathematical Union, from 2008 to 2009. At present, she works at the University of Valencia, where she was Vice Chancellor from April 2010 to March 2014.

For her part, Eva Antonia Gallardo Gutiérrez (Seville, 1973) is a PhD in Mathematics from the University of Seville. She became a professor at the Complutense University of Madrid and in November 2019 she was elected First Vice President of the Royal Spanish Mathematical Society, becoming president in 2022.

3. THE ROYAL PHARMACEUTICAL SOCIETY: ITS ORIGINS

In Great Britain, the history of the Royal Pharmaceutical Society (hereinafter RPS) goes back to the Middle Ages, when the pharmacy was a trade controlled by the Company of Grocers, a guild that regulated the sale of spices, meats, food and beverages. At one point, the apothecaries, who manufactured and sold drugs, decided to abandon their guild, to take responsibility for the drugs they produced and to ensure that they were not adulterated, so they separated from the Company of Grocers in 1617 and were incorporated in London as the Worshipful Society of Apothecaries. This society, in addition to being responsible for the sale and manufacture of medicines, acquired powers to inspect medicines, requiring then a seven-year apprenticeship for those who wanted to be apothecaries.

In 1704, thanks to the Worshipful Society of Apothecaries winning the Rose Case against the Royal College of Physicians, apothecaries were able to prescribe and dispense drugs, just like physicians, and later, a new pharmacy trade emerged in the 18th century, when the industrial revolution began.

However, the emergence of new chemists and pharmacists in urban areas made them different from apothecaries, even though they were completely unregulated and without a national entity to represent them.

In 1815, the newly introduced Apothecaries Act required all practicing apothecaries to be licensed, with the objective that the Worshipful Society of Apothecaries could control chemists and pharmacists. These were required by law to become apothecaries or stop dealing in medicines. However, they fought against that law and managed to continue as they were, although that fight showed that the new chemists and pharmacists needed to join together to maintain their interests.

A Medical Reform Bill was proposed in 1841 to prevent chemists and pharmacists from dispensing medicines unless they were qualified to do so, thereby eliminating the need for a separate pharmaceutical profession. On February 10 of that year, chemist Jacob Bell met with other London-based chemists and pharmacists to discuss that bill. Consequence of that meeting was the foundation of the Pharmaceutical Society of Great Britain, on April 15, 1841, at the meeting held at the Crown and Anchor Tavern, on the Strand, in London. William Allen, who had proposed the motion, which was seconded by John Bell, father of proponent Jacob Bell, was voted to be the first President of the Society.

The first Council of the same had 40 members, who were responsible for creating the statutes and structure of the Society. In September of that year, a house at 17 Bloomsbury Square for their meetings was leased.

Since then, this society has had more than one hundred and seventy presidents, but it was not until June 1947 when a woman, Jean Irvine, held that position, thus becoming the first woman president of what would later be called Royal Pharmaceutical Society.

Further information on the origins of this society can be checked on (24) or on the website of the society (25).

4. THE ROYAL SOCIETY OF CHEMISTRY: ITS ORIGINS

The origins of the Royal Society of Chemist (hereinafter RSC), the oldest chemical society in the world, go back to the foundation of the Chemical Society of London in 1841. A total of 77 scientists, academics, manufacturers, and entrepreneurs decided to create it to achieve general advancement of Chemical Science and hold meetings for the communication and discussion of discoveries and observations on that discipline. The dialysis inventor Thomas Graham was their first President, and seven years later Queen Victoria granted a Royal Charter to the Society.

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Later, in 1877, the Institute of Chemistry of Great Britain was created to give responses to the need for properly qualified chemists. Later, the Institute became the Royal Institute of Chemistry. Its main objectives were to advance the profession of chemistry and ensure that chemistry professionals were thoroughly and properly qualified and trained.

The founding of the Society of Public Analysts was due to the rapid growth of the chemical industry during the nineteenth century in Great Britain, a growth for which chemists were not analytically well prepared at that time. With this motive of improving the knowledge of analytical chemistry, this society was formed in 1874, which subsequently became the Society for Analytical Chemistry.

The Faraday Society, so-called in honor of 19th century chemist Michael Faraday, was founded in 1903 to publish research in physical chemistry. It was publishing papers of interest in that topic until 1971 when the Royal Society of Chemistry took over the publication.

These four mentioned institutions, the Chemical Society, the Society for Analytical Chemistry, the Royal Institute of Chemistry, and the Faraday Society merged in 1980 to the Royal Society of Chemistry, which was granted a new Royal Charter in 1980.

Further information on the origins of the Royal Society of Chemistry can be checked in the website of the society (26) or in (27).

5. JEAN IRVINE: HER BIOGRAPHY

Jean Kennedy Irvine (née Jean Kennedy) was born on July 22, 1876, in Hawick, Scotland (Great Britain). Her parents were Walter Phillips Kennedy, a bookseller by profession, and Jane Kennedy (née Law) (28).

Her link with the Pharmacy started when she began working as an apprentice in the pharmacy of the pharmacist Thomas Maben, located in her hometown. Later, at the age of 24, she graduated in Pharmaceutical Chemistry from the Pharmaceutical Society in 1900 (29).

After graduating, she began working as a pharmaceutical assistant and later became chief pharmacist for the Glasgow Apothecaries Company. After working for the well-known Glasgow pharmacist, John McMillan, she became a member of the staff of the Glasgow Royal Infirmary (30).

On June 2, 1904, she married the pharmaceutical chemist Peter Irvine (1876-1949) and began helping him run the two pharmacies he owned in Glasgow. However, at the outbreak of World War I, he was conscripted into the army, and she moved to London to be closer to him. There, she worked in the National Health Insurance, in 1914, dealing with checking the prices of prescriptions

and two years later, in 1916, when the centralized price offices were established, she became the superintendent of the Joint Committee for the Fixation of Prescription Prices (Southeast Division). This committee was responsible for overseeing prescription prices in the region, and she remained in that position for 35 years, until her retirement in 1947 (29).

During her career, she held many honorary positions and was the recipient of numerous honors. In 1928, she was made a Member of the Order of the British Empire for "meritorious service in connection with the National Insurance Scheme" (30).

She became the first woman president of the staff side of the Whitley Council for National Health Insurance administrative, technical, and clerical services (31). She was also first president and then honorary secretary of the National Association of Women Pharmacists. That Association sponsored her to stand for election to the Council of the Royal Pharmaceutical Society in 1937, which made her become the third woman member of the Council in its history and later, in June 1947, the first woman President, aged 70 (32). As a curiosity, she, well known for her strength of character, once described the Council as "crazy" in a public session. However, she was well respected for her support and encouragement of younger colleagues (25).

Precisely, in the speech of acceptance of that presidency, Jean Irvine mentioned the book "Physica", written by Hildegarda de Bingen in 1533, which was in the Library of the Society, and referring to it, she affirmed that anyone who doubted the place of the woman in the pharmacy story should read it (33).

Jean Irvine remained on the council until 1952. During her time as President of the Royal Pharmaceutical Society oversaw the terms of the Royal Pharmaceutical Society's final agreement with the University of London on the transfer of the new building in Brunswick Square, which would house its school of Pharmacy, now University of London School of Pharmacy (29).

In 1957, Robert Norman Hepple (1908 – 1994), English portrait painter, engraver and sculptor, best known for his portraits of the British royal family, painted the portrait of Jane Irvine in oils, which was exhibited at the Royal Academy's summer exhibition and later hung in the council chamber at the Pharmaceutical Society's headquarters in Bloomsbury Square (Figure 2). At present, that portrait is part of the collections of the Royal Pharmaceutical Society (34).

Jean Irvine died on March 3, 1962, aged 85, at 166 Westbourne Grove, Paddington, London. A requiem mass was celebrated for her on 8 March 1962 in the Church of the Most Holy Redeemer, Cheyne Row, London, followed by a private burial (35). The newspaper "*El Pharmaceutical Journal*" honored her with several posthumous tributes. In one of those articles in her honor, you can read the following (31):

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Figure 2. Portrait of Jean Kennedy Irvine, by Norman Hepple. Source: (34).

Mrs. Irvine was forthright in her opinions, which she combined with granitic honesty of a Scot educated in the Victorian era; a virtue perhaps not always appreciated by those who live in the gender South, but she was recognized as a major force in the organization which set out to secure for women equal opportunities with men.

In 2019, the name Jean Irvine was added to the Oxford Dictionary of National Biography (36).

6. LESLEY YELLOWLEES

Lesley Jane Yellowlees was born in London in 1953. Her father was an employee of the Rank Hovis McDougall company, and she had two sisters (37).

At the age of 9, she moved to Edinburgh, Scotland, where she studied at St Hilary's Girls' School. She completed her university studies at the University of Edinburgh, where she graduated in Chemical Physics in 1975 and subsequently obtained a PhD in Inorganic Electrochemistry in 1982, with a doctoral thesis entitled "Spectro-electrochemical studies on luminescent complexes". She was the only woman to graduate from her class. Regarding it, in 2013, Nicola Davis affirmed on her (38): "I saw something no one else had seen".

After graduating, she first worked as an administrator in the National Health Service, moving shortly thereafter to Australia, to Brisbane, where she began her research studies in electrochemistry and later worked at the University of Queensland. After finishing research positions in Brisbane, Lesley Yellowlees returned to an academic position in Edinburgh in 1986 to do a new PhD in Solar Cell Chemistry,

In 1986 she worked as a demonstrator, in 1989 as a lecturer and a few years later, in 2005, she gained a personal chair in Inorganic Electrochemistry.

She became the first woman to be appointed Head of the School of Chemistry in University of Edinburgh and then Vice Principal and Head of the College of Science and Engineering at that University.

In 2005 she was appointed Fellow of the Royal Society of Chemistry and in 2012 she became Fellow of the Royal Society of Edinburgh and also Fellow from the Institute of Physics (39).

In 2012, on July 4, she assumed the presidency of the Royal Society of Chemistry for a period of two years, becoming the first woman President in 175 years (26). She was succeeded by Dominic Tildesley, British professor, and chemist, born 1952, who had obtained a doctorate at Oxford University in 1976. At present,

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Figure 3. Professor Lesley Yellowlees and Ian Blackley, unveil the plaque on April 27. Source: (41)

he is director of the European Center for Atomic and Molecular Computation at the Ecole Polytechnique Federale de Lausanne in Switzerland (40).

On the occasion of this election as president of the Royal Society of Chemistry, 2012 was a year of great activity for Lesley Yellowlees.

That year and for the second time in a row, the Zoological Society of London and the L'Oréal-UNESCO For Women in Science program convened some of the UK's leading scientists to give talks to promote science. Among those women were Lesley Yellowlees, Professor Dame Athene Donald, an advocate for equality at Cambridge University, and Professor Sunetra Gupta, a successful novelist, awarded the Royal Society Rosalind Franklin Prize for her scientific discoveries.

Likewise, on May 5 of that year, while already president of the Royal Society of Chemistry, Lesley Yellowlees condemned the

theft of the historic chemical plate, blue coiled, hexagonal, dedicated to the legacy of James "Paraffin" Young that was located in the outer wall of the Bennie Museum, in Bathgate, West Lothian.

That plaque was unveiled by "Paraffin" Young's great-great-grandson, Ian Blackley at a ceremony attended by politicians, schoolchildren, scientists and others. Mr Blackley said at the ceremony: "This reminds us that important scientific breakthroughs can have a lasting legacy for many generations".

The inscription on that plaque read the following: "In recognition of the outstanding contribution, made on a site close to here in Birniehill, Bathgate, where in c.1850 he processed torbanite ("cannel coal") to create the first commercial production of paraffin oil in the world, leading to the major shale oil industry in West Lothian" (Figure 3).

With respect to that theft, Lesley Yellowlees (Figure 4) said as follows (26):



Figure 4. Lesley Yellowlees standing in front of past portraits of RSC Presidents at Burlington House, Piccadilly. Source: (26)



This is awful news and very sad. All of those that were so involved with the museum gaining the plaque must be devastated too. I hope the police either find out who was responsible for the theft or that the thief or thieves have the decency to return the plaque.

In 2015, Lesley Yellowlees became an Honorary Member of the Royal Society of Chemistry (42).

In an interview made in 2015 at the University of Edinburgh, she answered the following (43):

Your time at the University

I always enjoyed chemistry, physics, and maths at school and, being a lot more indecisive than I am today, decided to study chemical physics at university. The Edinburgh University curriculum was flexible enough for me to keep my options open in all three areas until the end of second year and so I came to Edinburgh unsure of what subject I would settle on but sure that I wanted to go to university and study science. In the end, I stuck with my original choice and graduated in chemical physics in 1975 – the only girl in my year.

In my first year, the miners went on strike, which resulted in intermittent electricity. Lectures could no longer take place in the Appleton Tower lecture theatres and all lifts were out of action. Lectures were held instead in the top floor labs in AT and I would arrive at my 9 o'clock lectures exhausted and out of breath. We had to pay a chemistry lab deposit at the beginning of each session. I can well remember the cheer that went up when a fellow student on checking their glassware dropped their drawer of pipettes, flasks and measuring cylinders and broke the lot.

My final year involved punch cards in which I always managed to get a hole in the wrong place, struggling with quantum mechanics, parties, hard work and the decision to leave science behind, I realized my mistake within a few months. On immigrating to Australia to take up a research position at the University of Brisbane, I started my lifelong passion in the field of solar energy. I realized that to have any chance of a successful research career I would need to have a PhD qualification and so returned to The University of Edinburgh in 1983 to study for my postgraduate qualification in inorganic electrochemistry. I found the transition from employee back to a student challenging but persevered and ultimately thoroughly enjoyed working for my thesis if not writing it!

The University has given me fantastic opportunities - I

think if you were to cut me through the middle like a stick of rock, I would read "University of Edinburgh".

Tell us about your Experiences since leaving the University.

I studied my post-doctorate at the University of Glasgow and then returned to Edinburgh as a senior demonstrator in 1986 and have never left. I have held a variety of roles within the University, balancing my job with raising a family and have enjoyed a wonderfully fulfilling career hugely supported by family, friends and colleagues. My research concentrated on developing Spectro electrochemical techniques for the study of potential solar energy dyes and has resulted in many worldwide collaborations. I gained a personal chair in inorganic electrochemistry in 2005 when I also became Head of the School of Chemistry - a very exciting and demanding role that I loved. On completing my five-year term, I then became Vice Principal and Head of the College of Science and Engineering which has enabled me to hone my leadership skills.

Whilst pursuing my academic career I also worked extensively with the Royal Society of Chemistry, my professional body with 60,000 members worldwide. In 2012, I became their President - the first woman to hold that position in their 170-year history - what an honor and a privilege that was. My main objective during my two-year presidency was to raise the profile of women in science and engineering - a message that resonated in the UK and internationally. In 2005, I was awarded an MBE for services to science, and a CBE in 2014 for services to chemistry and elected as a Fellow of the Royal Society of Edinburgh.

And Rebecca McQuillan (37) affirmed on her: "You've got to have support because work is not always going to go well".

To date, Lesley Yellowlees has been the recipient of numerous awards and honors. She was appointed a Member of the Order of the British Empire in 2005 for services to science, as well as a Commander of the British Order in the 2014 New Year Honors for services to chemistry (44). She is Fellow of the Royal Society of Edinburgh and an honorary doctorate from Heriot-Watt (2012) and Edinburgh Napier (2016) universities.

Lesley Yellowlees is a huge supporter of women and science. With the aim of commemorating the International Year of Chemistry, in 2011, the International Union of Pure and Applied Chemistry (IUPAC) included her in its selection of women for the Award for Distinguished Women in Chemistry/Chemical Engineering for her scientific contributions to this discipline worldwide. Her research interests included inorganic electrochemistry,



electrochemistry, Spectro electrochemistry, electron paramagnetic resonance spectroscopy, solar energy, and CO₂ conversion. Other interests included the public outreach of science, and the promotion of women scientists.

She was also named the 2013 Alumnus of the Year at University of Edinburgh in honor of her research, leadership and her work as an advocate for women in STEM subjects and in 2014, she was included in the BBC's list of 100 distinguished women (45). Her image has already been immortalized on several occasions. The National Portrait Gallery has two portraits of her. There is also another portrait of her, painted by Peter Edwards, in the main staircase in Burlington House, the headquarters of the Royal Society of Chemistry.

Lesley Yellowlees is currently married to Peter W. Yellowlees, a Chartered Accountant and has two children, Sarah and Mark. She is University Assistant Director and Full Professor of the Faculty of Science and Engineering at the University of Edinburgh. Her re-appointment runs from 3 October 2021 to 2 October 2025.

Lesley Yellowlees is also a woman who is very committed to social issues, gender, environment, and diversity. At present, she continues to be a strong advocate of equality between men and women in general and of the role of women in the relatively novel STEM education. In this regard, related to parity, she affirmed that (42):

Diversity these days also means taking into account what areas of chemistry women are representing and that has also changed significantly in recent years. We are seeing not just parity among the male/female A-level chemistry ratio and not just a significant rise in the number of women academics, but also the role of female chemists in all sorts of walks of life is becoming more influential all the time.

And some of her opinions on the last matter are the following (42)

There is still some way to go in terms of academic positions, with most recent figures showing the number of women in senior positions in university chemistry departments remaining relatively low at only 6.0% at professor level and 13.6% at senior lecturer level in 2006-07. But it is worth noting that these figures had hugely increased from 0.8% and 4.9% respectively from 1997-98.

Although 73% of female STEM grads are not in STEM employment, compared with 52% of men, this really reflects the range of careers that women enter. It's incredibly positive to move away from an obvious chemistry-related career into other areas and applying that scientific knowledge to other fields.

A striking gender divide persists in other STEM subjects. Despite total number increases in the number of both girls and boys sitting physics, the divide remains at approximately 1 girl for every 4 boys achieving A level physics. In Maths, 60 % of A-level candidates were male while more than 77% of males studied "other sciences".

8. CONCLUSIONS

In this article, authors show the enormous difficulties that in the period between the end of the 19th century and the first decades of the 20th century, the current laws of the time placed women in relation to the access to their university studies and later to the exercise of their profession. And not only these difficulties did exist, but even in the case of those women who could overcome them and graduate in some university career, then the scientific societies themselves placed another large number of obstacles to allow them access as members. And not to mention to allow them to occupy some managerial position once these women had entered them.

However, there were several women in many countries, especially European ones, who tried to overcome these difficulties with effort and tenacity, constituting a true model for others, who decided to follow those footsteps and fight to get the same rights as men, as far as academic training and professional work is concerned. Two of these women were the British Isabella Clarke-Keer and Margaret Buchanan. The first, Isabella Skinner Clarke-Keer (née Clarke) (1842-1926), was a pharmacist and pioneer of women in pharmacy. In 1875, she became the first woman to qualify as a Pharmaceutical Chemist and in 1879 was one of the first two women admitted as members (with Rose Minshull) of the Pharmaceutical Society (46). The second, Margaret Buchanan (1865-1940), was registered as a Chemist and Druggist in 1886, being the only female student at the Pharmaceutical Society's School of Pharmacy to take double honors in its exams. She was also the first woman to be awarded its Silver Medal. She started working as a hospital dispenser at the Westminster General Infirmary. Later, she became a businesswoman. She founded in 1913 the Margaret Buchanan School of Pharmacy for Women at Gordon Hall, Gordon Square in London. She also worked as Lecturer in Pharmacy at the London School of Medicine for Women and was a member of the Teachers' Guild (46).

As at that time, in the early 20th century, women were not allowed to join the Pharmaceutical Society, these two women, Isabella Clarke-Keer and Margaret Buchanan, together with a group of women pharmacists, came together to establish, on June 15, 1905, the Association of Women Pharmacists (at present, National Association of Women Pharmacists), to which 50 women joined

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immediately, appointing Isabella Clarke-Keer as the association's first President and Margaret Buchanan Members as Vice President (46), (47).

Two other women who exemplify this situation are those studied in this work, Jean Irvine and Lesley Yellowlees, who became the first women to hold the presidency of the Royal Pharmaceutical Society and the Royal Society of Chemistry, respectively.

All these mentioned women can be considered, without any doubt, as references and models to be followed by the rest of the women who wish to study a career and then practice their profession, getting in this the distinctions and awards that their work has deserved, in the same way as men.

Fortunately, the situation of inferiority of women compared to men has already changed a lot, especially in the European and American continents, and today there are no obstacles for women to study a university degree, or to later practice their profession, and not even to become part of scientific societies, although it is true that there are still very few of them who have got to hold management positions in those societies. Do not forget that the reality indicates that the percentage of women who occupy these positions, especially the presidencies, compared to that of men is still very small and that effects such as the so-called glass ceiling or the Matilda effect are still valid in our society (see (48) to (55), for instance, for further information on gender and science).

Since scientific work must ultimately be judged on its merit, and not on the nationality or sex of its author, authors think that opposition to the election of women in scientific societies will soon be seen to be unfair and detrimental to the progress of natural knowledge. By no pedantic reasoning can the rejection of a candidate for membership in a scientific society be justified if the work done places the candidate in the leading position among other competitors. Science knows no nationality, and must not recognize any distinction of sex, color, or creed among those who are contributing to its advance. Firmly believing that this is the conclusion to which consideration of the issue must inevitably lead, we are confident that the doors of all scientific societies will eventually be open to women on equal terms with men.

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