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RSC Historical Group Newsletter No. 85 Winter 2024

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ROYAL SOCIETY OF CHEMISTRY HISTORICAL GROUP MEETINGS

Group members should receive an e-alert from the RSC informing them when the latest newsletter is available, but for the record the Newsletter appears twice each year – usually in January and July (apologies that this

We welcomed five new members to the committee, elected in our first group-wide ballot, and they are already making an important contribution to our activities. Our long-standing committee member, Chris Cooksey decided to retire at the end of October and we are very grateful for his service to the committee.

Peter Morris

ROYAL SOCIETY OF CHEMISTRY HISTORICAL GROUP MEETINGS AND ONLINE LECTURES

- the discovery of insulin and the methods used over the last century to monitor its effectiveness in the treatment of diabetes, via glucose estimations in blood and urine
- the discovery of the drugs used to attack, cure and control the scourge of tuberculosis

some aspects of the history of anaesthesia, with special reference to the early use of chloroform.

Online Lectures

These are continuing on the third Tuesday of each month at 2 pm. In January 2024 Paul Craddock will speak on the *Early History of Zinc and Brass* and in February, Katie McClure will speak on *Morton Sundour Dyes*. The lectures are presented on the RSC Zoom Platform at 2 pm. Please start to log on at 2 pm sharp. Look out for the Zoom links in the e-

delving into the history of her work

not lessen the enjoyment of the preparation. Nowadays in some taught laboratories, the quantities are often measured in mg! The preparation of benzidine was an exception, involving 2g of this highly carcinogenic species and which I followed Mee to the letter. I still have nightmares about my experiments with this species and the quantity of it I produced – the Mee text does not mention the toxicity.

Just to balance things out, I should mention that I also (tried to) read a theoretical chemistry text by J.W. Linnett [3] which contained no home experiments to perform but probably sowed the seeds for my subsequent career years later.

By the time I started my university course in 1968, I was able to shut down my home laboratory (much to the relief of both parents) and continued in a somewhat safer university laboratory. Perhaps unsurprisingly, given the six years or so of practical experience I already had, I was delighted to win a prize for practical chemistry in my final year. By this stage of course, the

Encouraged by his father, Perkin left college and set up a factory at Greenford in Middlesex to make the

After completing his college diploma, William stayed for another academic year as assistant (unpaid) in the advanced laboratory.

The results of his earliest research were published in two papers that appeared in 1880, both in [6, 7]. Both involved studies of reactions of what was then called phenylic acetate (phenyl ethanoate in modern nomenclature). In the first case, the reaction with sodium was studied [6]; in the second, reaction with benzylic chloride (chloromethyl-benzene) was studied. Experiments involved

met his future wife Mina and eventually Kipping and William became related by marriage, as they each married one of the Holland sisters [3]. William's financial position improved sufficiently on his appointment to the chair at Heriot-Watt to put him in the position to marry Mina, which he did on 31 December 1887.

During William's time in Edinburgh he was elected FRS (1890). Then, in 1892, he was appointed to the Chair in Chemistry at Owen's College, Manchester. Shortly after his arrival, this institution became a fully-fledged university, with the formation of the Victoria University. Originally

Then, in December 1912, William was appointed to the Waynflete Chair of Chemistry at Oxford University. He was preceded in this position by William Odling (1829-1921), who had not done research since 1876 and whose attitude can be summed up as “Odling was not a slave to his laboratory, which he thought it a breach of etiquette for the professor to enter” [4]. William was determined to change things.

Once again, this entailed a building project. William’s plan was to have a university facility, and not rely on college laboratories, of which there were five when he arrived in Oxford. By 1915 he had secured the necessary funding, including a significant donation from the philanthropist and owner of the company that made Worcestershire Sauce, C.W. Dyson Perrins. The resulting laboratory was named in the latter’s honour and the first part, comprising the central block and western wing, were completed in 1916. Later, in 1922, a second stage was completed.

William filled the new building with research students. He was also instrumental in introducing the DPhil degree (in 1917) and, around the same time, of adding the research fourth year to the BA degree in chemistry [3]. This was a significant development, not only in Oxford, but well beyond. Although no other university followed Oxford in having a full extra year, they all gradually introduced a research component to the final year of their degree courses, and now a chemistry (or any other science) degree without a final year research project is unthinkable.

William continued his personal experimental work, as well as his research degree supervision, more or less up to the end of his life. In 1929, he became quite ill, and a holiday in Switzerland with his wife made no difference. They returned to Oxford, where he died on 17 September. William and Mina were childless. Both were enthusiastic about music, often hosting musical evenings at their home and William played the piano for

assistant in experimental work [14]. Sadly, she was never mentioned as a co-author on the resulting research papers.

Arthur’s work had strong similarities to William’s. It used the simplest apparatus and careful manipulations, though it was more narrowly focused,

Frederick to physical chemistry, which he, alone of the Perkin brothers, was to pursue later in his career.

In 1897, Frederick was appointed Head of the Chemical Department at the Borough Polytechnic Institute in South London (now London South Bank University). Perkin established what he called the “Electrochemical Laboratory”, from which he published a number of papers, mainly in . Interestingly, in these papers he styled himself F. Mollwo Perkin. One of his papers, entitled “A simple form of rotating electrode for electrochemical analysis” described a technique not unlike polarography [21].

In 1903, Frederick became the first treasurer of the Faraday Society, and stayed in that position until 1917, long after he had left the academic world. During his time at the Borough Polytechnic Institute, he also wrote a book “Practical Methods of Electrochemistry”.

Frederick set himself up as a consultant in 1909, working first in his late father’s old laboratory at Sudbury, and later in his own laboratory at his

appointed to the chair at the University of Munich. There, he built up a substantial team of researchers occupying modern, well-equipped laboratories for which he raised significant amounts of money. He became the leading organic chemist of his age, winning the Nobel Prize for chemistry in 1905. He was also awarded the Davy Medal in 1881, and was elected a Foreign Member of the Royal Society in 1885. Details from: https://www.nobelprize.org/prizes/chemistry/1905/baeyer/biographical/. Accessed 15.11.2023

10. G. Nagendrappa, , 2014, 19, 489.

11. C. A. Russell, (Leicester: The University Press, 1971).

12. W. H. Perkin Jr., , 1883, 16, 1787.

13. W.

Tuberculosis of the lungs is an ancient disease. It is evident in skeletons from the Early Bronze age and pre-Columbian Peru and may have

However Dubos' success caused Waksman to investigate his soil samples in case they contained potentially useful, similar, agents. This work was particularly far-

treatment was against tubercular infections in a variety of organs. Tubercular meningitis was invariably fatal, but in 1950 a combination of streptomycin and PAS was found to be a particularly effective treatment. This started the era of “combination therapy”, which persists today. The patient is treated with two or more anti-

alternative medications in multiple combinations – a cost which health systems under pressure in poor economies are not able to meet.

The last forty years or so has seen the emergence of the AIDS epidemic in full force. People with weakened immune systems are particularly prone to infection with TB and this has led to a large increase in the rates of TB in Africa and elsewhere. Most of this TB responds well to medication - provided it is available. Resistant TB can emerge in this setting too, for the same reasons as in Eastern Europe.

Treatment resistance is the main concern about the future risk posed by TB to mankind. The Captain of Death might have been demoted in the 1950s, but he wasn't court-martialled. Is he rising through the ranks again?

Acknowledgments

The struggles to find a cure for tuberculosis are well told in Long's text [7] and in the book by Ryan [9]. The latter presents a highly readable account of the personalities involved in the discoveries and we are grateful to the late Dr Anthony Mellersh (formerly of the City Hospital, Derby) for drawing our attention to it. Most of the early anti-tubercular drugs are dealt with in the text by Dyson [8], which is the source of the synthetic sequences featuring in this article. There are many internet articles on the subject of tuberculosis. A good (historical) one to start with is reference 10.

This article first appeared in in 2004 [11] but only as a hard-copy version. This slightly adapted Newsletter iteration is the first on-line appearance.

References

1. Specimens are stained with hot carbol-fuchsin, a red dye which contains detergents. This stains all bacteria red. Those which retain the dye on treatment with acidified alcohol are known as . See http://alan.kennedy.name/crohns/primer/bactid.htm.

2. H.L. Tidy, . (Bristol: John Wright & Sons Ltd, 1945).

3. W.A. Guy, (London: John Churchill, 1851).

4. A.T. Dronsfield, J. Cassella and P.M. Ellis, , 2002, 39, 72-75.

5. S. Waksman, Nobel Prize lecture, accessible at http://www.nobel.se/medicine/laureates/1952/press.html

6. J. Lehman, , 1964, 90, 953-956.

7. E.R. Long, (London: Balliere, Tyndall and Cox, 1958).

8. G.M. Dyson, (London: Longmans, 1959).

9. F. Ryan, (Boston: Brown-Little,1993).

10. J.F. Murray, D.E. Schraufnagel and P.C. Hopewell, . Available at https://www.atsjournals.org/doi/pdf/10.1513/AnnalsATS.201509-632PS

11. A. Dronsfield, T. Brown and P. Ellis, ., 2004, 41, 15-18.

Alan Dronsfield, Pete Ellis and (the late) Trevor Brown

Hence this book is unusual, if not perhaps unique, in exploring not only practical chemistry, but also the laboratory context of that chemistry and the development of new apparatus, especially (and unusually) glassware. She goes on to argue that Germany and German chemists played a major role in the development of organic synthesis and that the contribution of Albert Ladenburg has been overlooked, although she also pays considerable attention to the work of Justus Liebig and August Wilhelm Hofmann.

Jackson begins her account, not with the so-called synthesis of urea as most histories of organic synthesis do, but with Justus Liebig's development of organic analysis and his concern with the nitrogen content of alkaloids. This problem is eventually solved by the Will-Varrentrap method developed in his laboratory. Ironically this success led to Liebig leaving the field of analysis when it became clear that even accurate empirical formulae could not solve all the mysteries of the pharmaceutically important alkaloids. Jackson then argues that Liebig's Kaliapparat led to a "glassware revolution" thanks to its use of glass-blowing. The next three chapters are about August Wilhelm Hofmann and his work

Francis Simon, Helen spent some time school teaching in London. In 1943, she worked for Philips Lamps on the structure of barium titanate. This is a perovskite material, and Helen was the first to show that the structure of this important material was of tetragonal symmetry in which the cations were displaced along one axis, making this crystal polar. It is because of this that barium titanate was of strategic interest during WW2. Today, it is used in electrical capacitors for its high dielectric constant. In 1945, Helen returned to Bernal's laboratory before becoming a Fellow and Director of Studies at Girton College, Cambridge. In 1957, she published the first book on ferroelectricity, which became a classic work in its time. Later, in 1973, she published a fine book, .

In the 1940s, she had the idea that crystal structure drawings would make excellent patterns for fabrics, and she approached the Council of Industrial Design with her ideas. Because of this, Helen was appointed scientific consultant to the Festival Pattern Group, responsible for the designs used in the 1951 Festival of Britain. The result was that her patterns and those of other crystallographers were adopted as the basis for the designs used at the Festival. Thus, the curtains in the restaurant, as well as cups and saucers, linen, carpets, ties, and many other objects, carried designs based on Helen's advice. Much of this material is now housed in the Victoria and Albert Museum. She remained at the Cavendish Laboratory until she retired to her Ballycastle, Co Antrim home. In 1989, she became the first woman to be awarded the Roebling Medal of the American Mineralogical Society. She also was awarded an honorary degree at Queen's University, Belfast. She died in 2002 at her home in Ballycastle.

Mike Glazer

John Kendrew (1917-1997)

John Kendrew was born in 1917 in Oxford to Evelyn Sandberg and Wilfred Kendrew, a climatologist at Oxford University. Kendrew was educated at the Dragon School, Oxford, then at Clifton College, Bristol. He went up to Trinity College, Cambridge, where he was awarded a 1st Class Chemistry BA in 1939.

The outbreak of war interrupted his Cambridge PhD research on reaction kinetics and he

This talk explored how chemical information has been published, organised and disseminated over the centuries, from the publication of early scientific journals until the advent of electronic databases. Factors which led to the

February - Diana Leitch: “Sir John Tomlinson Brunner and Henry Brunner- Their Lives and Legacy”.

January - John Hudson: “Alchemy, or How to Make Gold”.

2021

December - Peter Morris: “The History and Chemistry of Frankincense and Myrrh”.

November - Helen Cooke: “Structures: The Key to Chemistry Communication”.

October - Ann Ferguson: “The Ordeal Poison”.

September - Tony Travis: “A Century of Global Synthetic Ammonia 1921 – 2021”.

June -Peter Morris: “The History of Chemical Laboratories, 1600-2000”.

1972) who has been featured in a Historical Group Webinar in October 2023 and also in the summer 2021 .

100 years of Paediatric Clinical Chemistry, 1923-2023

Chemistry as practised across the world, and so it is fitting that one hundred years later, her achievements as one of the pioneer women of science are

Education. This biography aims to show how these different strands of Roscoe's career came together to make Roscoe one of the leading scientists

SOCIETY NEWS

Society for the History of Alchemy and Chemistry

2024 Morris Award: Call for Nominations

The Society for the History of Alchemy and Chemistry (SHAC) solicits nominations for the 2024 John and Martha Morris Award for Outstanding Achievement in the History of Modern Chemistry or the History of the Chemical Industry. This award honours the memory of John and Martha Morris, the late parents of Peter Morris, the former editor of *Ambix*, who has contributed the endowment for this award. The recipient chosen to receive the Morris Award will be expected to deliver a lecture at a meeting of SHAC, where the awardee will be presented with an appropriate framed photograph, picture or document and the sum of £300. The award is international in scope, and nominations are invited from anywhere in the world. Past winners of the Award include Ernst Homburg, Yasu Furukawa, Anthony S. Travis, Mary Jo Nye and Raymond Stokes.

A complete nomination consists of

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