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When I use a word Medical blue plaques—penicillin

English Heritage has only this year announced that it will start putting up blue plaques in areas of the country outside London. The first such plaque, at 2 Crossbeck Road in Ilkley, West Yorkshire, on what used to be St Winifred's Hospital, commemorates the work of the midwife Daphne Steele (1927–2004), the first black nursing matron in the NHS. It supplements a previous plaque to her that was put up on St James's Hospital in Balham, South London, where she trained as a nurse after coming to the UK from Guyana in 1951. However, other organisations have been putting up plaques outside London for many years. In Oxford, for example, there are several plaques celebrating different aspects of the development of penicillin, mostly put up by the Oxfordshire Blue Plaques Board. These include: a blue plaque on the Sir William Dunn School of Pathology in Saint Cross Road, Oxford, commemorating the isolation and purification of penicillin by Howard Florey, Ernst Chain, and Norman Heatley in 1938–41; a plaque to Heatley on his house in Old Marston; two plaques in the Old Radcliffe Infirmary in Woodstock Road, commemorating the first systemic clinical use of penicillin in treating infection; and two plaques to Dorothy Hodgkin, who elucidated the chemical structure of penicillin, one at the front of the Inorganic Chemistry Department in Oxford University and one on the front of her house in Woodstock Road.

Jeffrey K Aronson

Blue plaques outside London

In 1863 Mr William Ewart, MP for Dumfries Burghs, proposed, in a speech in the House of Commons, that the names of celebrated persons might be inscribed on houses in which they had lived. A few years later, the Society of Arts adopted the idea and began erecting what came to be known as blue plaques.¹ The first were put up in London in 1867, to Lord Byron in Cavendish Square, on a building that has since been destroyed, and to Napoleon III, in King Street, Westminster, which survives. During the following years the society put up 35 plaques, most of them coloured brown, although blue subsequently became the standard colour used. In 1901, the London County Council took over the scheme, and the scheme was continued by the Greater London Council when it replaced the LCC in 1965. On the abolition of the GLC in 1986, English Heritage took over.

Although the plaques erected by English Heritage have all hitherto been in London, other institutions have erected similar plaques elsewhere in the country, and recently English Heritage has decided to do likewise.

A celebrated nurse

Only about 15% of all English Heritage's plaques are dedicated to women, an imbalance that the society started to remedy in 2016, and earlier this year it announced that for the first time in 2024 blue plaques dedicated to women will outnumber those dedicated to men.

So it is that English Heritage's first blue plaque outside London, put up on 23 February 2024 under the heading "Historic England," is dedicated to a Guyanese nurse and midwife, Daphne Steele (1927–2004), who lived and worked at St Winifred's Hospital in Ilkley, West Yorkshire, now called Hillside

Court.² The plaque, at 2 Crossbeck Road, refers to her as a "Pioneering Black matron in the NHS."

Daphne Steele was born in Essequibo county in British Guyana, South America. Having trained in nursing and midwifery in Georgetown, she came to the UK in 1951 and worked in St James's Hospital in Balham, South London, where another blue plaque, put up by the Nubian Jak Community Trust and the Association of Guyanese Nurses and Allied Professionals, commemorates the fact that she trained and qualified there, and refers to her as "Britain's first NHS hospital matron of African descent." Her sister, an actress who goes under the name of Carmen Munroe, has appeared in many television shows, including *Doctor Who* and *Desmond's*. Perhaps she too deserves a blue plaque.

Penicillin and blue plaques in Oxford

Although English Heritage has only now started to put up blue plaques outside London, many other bodies have been doing so for a long time. Oxford has quite a few, mostly put up by the Oxfordshire Blue Plaques Board. Medical plaques include tributes to Richard Doll ("epidemiologist who discovered the main hazards of smoking"), George Claridge Druce ("botanist, pharmacist, mayor"), Gathorne Robert Girdlestone ("Pioneering orthopaedic surgeon"), Sir Ludwig Guttman ("Neurosurgeon; Father of the Paralympic Games"), Hans Krebs ("biochemist and Nobel Laureate"), and Chassar Moir ("pioneering researcher and surgeon"). There are also several plaques commemorating events related to the discovery of penicillin.

Taken in chronological order of events, the first is a round blue plaque erected next to the front door of the Sir William Dunn School of Pathology in Saint Cross Road, Oxford. It reads "In this building Howard Florey, Ernst Chain, Norman Heatley & colleagues first isolated and purified PENICILLIN for the

treatment of bacterial infection 1938–1941.” The story has been told many times, perhaps most readably by the American author Eric Lax, in his book *The Mould in Doctor Florey’s Pocket*.³

Norman Heatley also has a plaque of his own. In 1935 Ernst Chain, one of “Hitler’s gifts” to the UK,⁴ having left Germany in 1933, arrived in Oxford to work under Howard Florey in the Sir William Dunn School of Pathology. Chain suggested trying to purify the active antibiotic principle from a species of *Penicillium*. Florey assigned Norman Heatley to be Chain’s technician. As Henry Harris, Florey’s successor in the same department, commented in the Florey Centenary Lecture, delivered at the Sir William Dunn School on 29 September 1998, “without Fleming, no Chain or Florey; without Florey, no Heatley; without Heatley, no penicillin.” Heatley realised that penicillin was destroyed by acid, extracted it in alkali, and successfully purified it. So, without Heatley, no Nobel prize would have been awarded to Fleming, Florey, and Chain in 1945. Heatley’s own blue plaque can be seen on the house in which he lived in Old Marston, 12 Oxford Road. It reads “NORMAN HEATLEY DM 1911–2004 Biochemist key member of the Oxford penicillin team 1939–43 lived here 1946–2004.”

I was particularly pleased when I saw that the designer of the plaque had included Norman’s DM, because I was responsible for his having been awarded it. In 1990, preparing a meeting to celebrate the 50th anniversary of the first published account of the successful systemic clinical use of penicillin in the treatment of infection, I suggested to the then vice chancellor of Oxford University, Richard Southwood, that Heatley’s achievement should be celebrated by the award of an honorary degree. He agreed enthusiastically. I consulted Henry Harris. He was supportive, but said “don’t let them palm him off with an MA,” the typical long service reward for technicians (so-called “academic-related staff”) on retirement. I thought that it might be hard to persuade the Honorary Degrees Committee, of which I was a member, to award Heatley the higher honorary degree of DSc. I consulted Southwood again. He recalled that a few years earlier John Potter, a neurosurgeon whom I knew professionally, had persuaded the university to introduce the degree of honorary DM, but the degree had not yet been used. I proposed the honour and the committee recommended it. Norman was delighted and received his honorary DM degree, the first to do so in modern times, in June 1990. Today the Royal Society of Chemistry has an annual Norman Heatley Award and Oxford’s Dunn School holds an annual Norman Heatley Lecture.

The next plaque is not blue and neither is it round. It is an elliptical slate plaque, with white script on a black background, mounted on wood, and it hangs on a pillar in the main entrance hall in the old Radcliffe Infirmary in Woodstock Road, Oxford. The plaque reads “Penicillin made in the Sir William Dunn School of Pathology was first used for systematic treatment of infection in man in the Radcliffe Infirmary on 12 February 1941.” Some years ago the southern wing of the old Radcliffe Infirmary, on the ground floor of which I used to do my outpatients clinic, was converted to offices for the Nuffield Department of Primary Care Health Sciences. In May 2018 a new Oxfordshire blue plaque was unveiled on the side wall of the building on Woodstock Road. It reads “PENICILLIN The first antibiotic was first used to treat infection here at the Outpatients building of the former RADCLIFFE INFIRMARY on 12 February 1941.” So the first systemic clinical use of penicillin now has two plaques commemorating it.

Penicillin having been purified, it was important to determine its structure, and the task was given to Dorothy Hodgkin, a crystallographer working in the department of chemistry in Oxford. Georgina Ferry recounts how Dorothy was walking down South

Parks Road in Oxford one morning and met an excited Ernst Chain, who told her that they would some day have crystals of penicillin for her to study.⁵ Two plaques commemorate her and her work.

The first is a blue hexagonal plaque, on the front of the Inorganic Chemistry Laboratory in South Parks Road in Oxford. It reads “National Chemical Landmark Dorothy Crowfoot Hodgkin OM FRS (1910–1994) Led pioneering work in this building from 1956–1972 and elsewhere in Oxford on the structures of antibiotics, vitamins and proteins including penicillin, vitamin B12 and insulin, using X-ray diffraction techniques for which she received the Nobel Prize in Chemistry in 1964.” The plaque was put up by the Royal Society of Chemistry as one of a series of plaques commemorating important chemical science.⁶

The second is to be seen on the house in which she used to live, at 94 Woodstock Road. I pass it when I walk to work, and it reads “DOROTHY CROWFOOT HODGKIN OM FRS 1910–1994 Crystallographer Nobel Laureate in Chemistry lived here 1957–1968.”

Linguistic notes

Three linguistic points about these plaques are worth noting.

First, the origin of the word “penicillin.” It was invented by Alexander Fleming, who first used it in an article in the *British Journal of Experimental Pathology* in 1929, titled “On the antibacterial action of cultures of a *Penicillium*, with special reference to their use in the isolation of *B. influenzae*”: “In the rest of this article,” Fleming wrote, “allusion will constantly be made to experiments with filtrates of a broth culture of this mould, so for convenience and to avoid the repetition of the rather cumbersome phrase ‘Mould broth filtrate,’ the name ‘penicillin’ will be used. This will denote the filtrate of a broth culture of the particular *penicillium* with which we are concerned.”

“*B. influenzae*” is what we now call *Haemophilus influenzae*. The “particular *penicillium*” to which Fleming referred was *Penicillium rubrum*. “*Penicillium*” was the name that Johann Heinrich Friedrich Link (1767–1861) gave in 1809 to a genus of ascomycetous fungi, in a dissertation titled “*Observationes in ordines plantarum naturales. Dissertatio prima complectens Anandrarum ordines Epiphytas, Mucedines, Gastromycos et Fungos*” published in the *Magazin der Gesellschaft Naturforschender Freunde zu Berlin*. Link listed *Penicillium* as the tenth genus in the section on Mucedines and described three species, *Penicillium candidum*, *expansum*, and *glaucum*.

The IndoEuropean root PES meant a tail, as did the Latin derivative “penis.” The diminutive “penicillus,” a little tail, was used to mean a brush, and specifically a paintbrush. This came into Old and Middle French as “pincel” or “peincel” (in modern French, “pinceau”) and then into English as “pencil,” which originally meant a paintbrush, typically one with fine hair tapered to a point, suitable for delicate work, and later any tapered or pointed instrument for writing or drawing. “Pencil” is also slang for the penis, echoing the original etymology.

Secondly, the use of the word “systematic” in the plaque inside the Radcliffe Infirmary, where one would have expected the word “systemic.” This should not be regarded as an error. The word “systematic” has occasionally, albeit rarely, been used to mean systemic, the word that we would now use, and the *Oxford English Dictionary* lists examples from the 19th, 20th, and even the 21st centuries.

Thirdly, the use of the word “antibiotic” in the same plaque. The sulfonamides, which had been discovered by Gerhard Domagk in

the 1930s, are antibacterial drugs, but they were not originally regarded as antibiotics, defined as substances that are produced by living organisms and that can destroy or inhibit the growth of microorganisms. Sulfonamides are not found in living organisms; they are chemotherapeutic but not antibiotic. Today we use the term “antibacterial” to refer to antibiotics and other chemotherapeutic agents that are effective against bacteria and “antimicrobial” to broaden the spectrum to include protozoa, viruses, and other microorganisms. However, in colloquial use the distinction between antibiotics and chemotherapeutic agents has been lost and “antibiotic” is often used to refer to any antibacterial agent.

Further reading

There is more information and pictures of the plaques to which I have referred here at <https://www.phc.ox.ac.uk/news/blog/penicillin-in-oxford-four-plaques-and-a-memorial>.

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- 1 Aronson JK. When I use a word . . . Medical blue plaques in London. *BMJ* 2024;384:. doi: 10.1136/bmj.q421. pmid: 38365279
- 2 Historic England. Daphne Steele (1927 to 2004). Guayenese nurse and midwife who was a pioneering Black matron in the NHS. 23 February 2024. historicengland.org.uk.
- 3 Lax E. The Mould. In: *Dr Florey's Coat: The Remarkable True Story of the Penicillin Miracle*. Little Brown, 2004.
- 4 Medawar JS, Pyke D. *Hitler's Gift: The True Story of the Scientists Expelled by the Nazi Regime*. Richard Cohen Books, 2000.
- 5 Ferry G. *Dorothy Hodgkin. A Life*. Granta Books, 1998.
- 6 Royal Society of Chemistry. Chemical Landmarks (RSC Blue Plaques). <https://www.rsc.org/membership-and-community/chemical-landmarks-blue-plaque-scheme>.