

### Author biographies

**Curtis E Margo** is a general ophthalmologist and pathologist. He is a graduate from the Emory University School of Medicine, and he is a director of the ophthalmic pathology laboratory at the Morsani College of Medicine in Tampa, Florida, USA. He is a member of the Cogan Ophthalmic History Society.

**Lynn E Harman** is an ophthalmologist who specialized in glaucoma. She is a graduate from the University of South Florida School of Medicine and did her post-residency training at Emory University in Atlanta, Georgia, USA. She practiced ophthalmology at the Veterans Administration Hospital in Tampa, Florida, USA.

## Professor George Archibald Grant Mitchell (1906–1993): his work with penicillin during World War II

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Peter D Mohr  and Stephanie Seville

### Abstract

George Archibald Grant Mitchell, OBE, TD, MB, ChB, ChM, MSc, DSc, FRCS (1906–1993) was a professor of anatomy at the University of Manchester from 1946 to 1973. He is mainly remembered for his research in neuroanatomy, especially of the autonomic nervous system. He studied medicine at the Aberdeen University, and after qualifying in 1929 he held posts in surgery and anatomy and worked as a surgeon in the Highlands. In 1939, he joined the Royal Army Medical Corps. He was based in Egypt and the Middle East, where he carried out trials of sulphonamides and penicillin on wounded soldiers; in 1943, he returned to England as Adviser in Penicillin Therapy for 21 Army Group, preparing for the invasion of Europe.

### Keywords

Autonomic nervous system, George Mitchell, Manchester Medical School, neuroanatomy, penicillin, Royal Army Medical Corps, World War II

### Introduction

George Archibald Grant (GAG) Mitchell described himself as ‘a surgeon, soldier and academic’.<sup>1</sup> Certainly, his career falls into three parts: his medical education and posts in Aberdeen and the Highlands (1924–1939), his work in the Royal Army Medical Corps (RAMC) on the use of sulphonamides and penicillin (1939–1945) and his appointment as the professor of anatomy at the Manchester Medical School (1946–1973). However, his work during the War is not well known and that is the main focus of this paper.

The University of Manchester holds archives compiled by Professor Mitchell during the 1970s, relating to his wartime work, including the penicillin project.<sup>2</sup> The Manchester Museum of Medicine and Health (MMH) in the Faculty of Biology, Medicine and Health also holds

some papers related to historical medical objects, which he donated to the MMH in 1974; one of these, a brass reservoir penicillin syringe (1945), is of special interest and is described in a section below. The Aberdeen University holds a collection of his anatomical publications, mainly in connection with the award of his DSc in 1950. Other information has been gleaned from Mitchell’s papers on sulphonamides and penicillin in the *Lancet*, the *British Medical Journal* and the published report, *Penicillin therapy and control in 21 Army Group* (1945).<sup>3</sup>

University of Manchester, UK

#### Corresponding author:

Peter D Mohr, Museum of Medicine & Health, University of Manchester, Stopford Building 1.722, Oxford Road, Manchester M13 9PL, UK.  
Email: peter.mohr@manchester.ac.uk

## Scotland (1906–1939)

GAG Mitchell, the son of George Mitchell, a market gardener, was born in Portsoy, Aberdeenshire on 11 November 1906. He studied medicine at the Aberdeen University and graduated with first-class honours MB, ChB in 1929.<sup>4</sup> From 1930, he was a lecturer in anatomy under Professor Alexander Low (1868–1950) and also trained in general surgery under Professor John Marnoch (1867–1936) at the Aberdeen Royal Infirmary.<sup>5</sup> After Marnoch retired in 1932, Mitchell continued as a lecturer in surgery under neurosurgeon Professor James Learmonth (1895–1967), whose research on surgical sympathectomy stimulated Mitchell's interest in the autonomic nervous system (ANS).<sup>6</sup> In 1934, a year after he married Mary Gunning, he was asked to take over as resident surgeon in Caithness, part of the Highlands and Islands health scheme, a post which tested his surgical skills across the full range of specialities! The plan was that after 4 years he would re-join the surgical department; however, Learmonth had left in 1938, and any vacancy had lapsed. Fortunately, Robert Lockard (1894–1987), the new professor of anatomy at Aberdeen, was able to appoint Mitchell as a senior lecturer in anatomy – his future career was set.<sup>7</sup>

## World War II and North Africa (1939–1943)

Mitchell was already in the Territorials when he was called-up in 1939 to join the 15th (Scottish) General Hospital based in Aberdeen and was then posted to Cairo to help set up the No. 1 Orthopaedic Centre. The Hospital was a new building on the banks of the Nile, described by General Percy Tomlinson (1884–1951), as the 'Millbank of the Middle East', reserved for serious cases, with special units for orthopaedics and neurosurgery and was the main military hospital for the Middle East Force, which was embattled with General Rommel's troops in the Desert of North Africa.<sup>8</sup> Casualties from the El Alamein and other battles received immediate surgery at the forward base and mobile hospitals and then were evacuated to Cairo. Later Mitchell was transferred to the 42nd General Hospital in the Desert as Officer Commanding Surgical Division, and still later, as temporary Colonel, took charge of a 600-bedded hospital in Lebanon.<sup>9</sup>

His earlier publications dealt mainly with sulphonamides and topical antiseptics. In 1941, he co-authored a report on the causes of infection and poor outcome among 700 injured soldiers, admitted from forward hospitals, who had been treated with sulphonamides. He stressed that antibiotics were no substitute for careful surgery and that 'failures were due to incomplete or too late excision of damaged tissues, the presence of foreign bodies, tight suturing, insufficient drainage, or lack of rest; the liberal use of

sulphanilamide did not neutralise the neglect of these cardinal points'.<sup>10</sup> He noted that the oral dose varied considerably and those on larger doses had less sepsis, he recommended a standardised regime of sulphanilamide, 4.5 g thrice daily, with sulphanilamide powder applied to the wound. However, he found that oral sulphonamides were less effective in staphylococcal infections, for which, 'pending an adequate supply [of penicillin]', he recommended proflavine powder mixed with a topical sulphonamide for open infected wounds.<sup>11</sup>

In 1944, Lt. Col. Mitchell and others tested two new German sulphonamides, marfanil and prontosil (prontosil), which had been captured in Desert battles. They were not inhibited by pus, and marfanil was found to be the most effective sulphonamide to treat infected wounds and burns. Mitchell stressed that although penicillin was more 'uniformly successful in controlling wound infection' it would not be available in large amounts for some time, and 'many of the wounded...will have to be treated by less efficient substances'. He argued that marfanil was the best candidate so far, although it also was only available in limited amounts.<sup>12</sup> This work on sulphonamides would have been an important consideration for his later promotion as 'adviser in penicillin for 21 Army Group'.

## Penicillin in North Africa (1942–1943)

The general history of penicillin is complex.<sup>13</sup> This section is just a brief precis of the trials of penicillin in North Africa during 1943. Although Alexander Fleming (1881–1955) had discovered the antibiotic effect of penicillin in 1928, its clinical use was not practicable until Howard Florey (1898–1968) and Ernst Chain (1906–1979) had produced pure penicillin at Oxford.<sup>14</sup> In 1940, their team established the safety and chemotherapeutic properties of penicillin in animals.<sup>15</sup> Further experiments on the production and pharmacology of the drug were followed by clinical trials in a few patients with life-threatening infections, including a 'hopeless case' of meningitis, successfully treated by Fleming with intrathecal penicillin.<sup>16</sup> By 1943, further trials showed that it could be safely given by mouth, intravenously or intramuscular injection, and independent research in Egypt by pathologist, Lt. Col. Robert Pulvertaft (1897–1990) proved it was also effective for the topical treatment of wounds and burns.<sup>17</sup>

The next stage was to test it on soldiers with septic wounds. A small amount of penicillin produced by ICI Dyestuffs in Manchester was available to the Army; Professor Florey and Brigadier Hugh Cairns (1896–1952), consultant neurosurgeon to the Army, decided to test its use under battlefield conditions in North Africa. They needed to develop standard dosage regimes and methods of delivery for different types of injury. Their findings were detailed in a confidential report for the War Office,

*Investigation of War Wounds*.<sup>18</sup> During 1942, they visited various military hospitals across Egypt and North Africa. The penicillin trials were organised by surgeon Lt. Col. Ian Fraser (1901–1999) and pathologist Major Scott Thomson (1909–1992) at selected forward base and specialist hospitals. They monitored the bacteriology, clinical outcome and reports on how the penicillin was used in over 300 wounded soldiers.<sup>19</sup> At this stage, Mitchell's exact involvement in the penicillin trials is unclear; he was still based in Cairo and probably not directly involved with the trials at the forward base hospitals; however, he was asked to provide reports on the bacteriology and outcome of 163 infected compound fractures, which were not treated with penicillin – a fifth still unhealed after 3 months.<sup>20</sup>

The recommendations of Florey and Cairns were clear; wound infection was the main factor in preventing recovery and discharge. Penicillin was an effective treatment and 'should be used in the first instance for the early treatment of wounds and fractures at the Forward Base'. Parenteral treatment was better than topical application, and an allocation of 750,000 units should be made for each casualty. Finally, the RAMC would need an official manual about dosage regimes, treatment techniques and so on. A War Memorandum, *The Use of Penicillin in Treating War Wounds* (1944), was issued by the Penicillin Clinical Trials Committee.<sup>21</sup> In a few pages, it set out instructions on the use of penicillin for burns, soft tissue wounds, gas gangrene, compound fractures and injuries to the chest, abdomen, head and eyes. Local treatment might be adequate for burns and simple wounds; otherwise a course of intramuscular injections (15,000 units, 3-hourly injections) or an intravenous saline drip (120,000 units in 24 h) should be given. However, penicillin was scarce and to avoid waste, the supply and storage should be strictly controlled by a 'pathology penicillin officer' and in addition, a 'surgical penicillin officer' should be appointed for 'each theatre of operation' to oversee its clinical use.

### **Adviser in penicillin therapy for 21 Army Group (1943–1945)**

The post of 'surgical penicillin officer' was critical to ensuring the correct and economical use of penicillin by the RAMC. Florey and Cairns defined the necessary qualities:

he should be an officer with extensive experience of wounds in the war with experience of penicillin. He would visit surgeons of the Command, demonstrate the use of penicillin, see that it was suitably used, and that the hospital was adequate. He should keep himself informed of all technical developments of the use of penicillin.<sup>22</sup>

Mitchell was an experienced surgeon and well regarded for helping to set up the hospitals in North Africa (promoted to temporary Colonel during this period). His academic background and work with sulphonamides placed him in a good position for the post. He had a good working relationship with his chief in Cairo, Colonel Arthur Porritt (1900–1994), a London surgeon at St Mary's Hospital who had served in France and was later posted to Cairo.<sup>23</sup> In December 1943, both men were recalled to England to join the 21 Army Group. General Montgomery (1887–1976) promoted Porritt to Brigadier and 'Consultant Surgeon to 21 Army Group,' and Mitchell was appointed as 'Adviser in Penicillin Therapy to 21 Army Group'. The 21 Army Group, established in July 1943, included British, Canadian and Polish troops training for the invasion of Normandy under the command of General Montgomery. Together with the United States Army, under General Dwight Eisenhower (1890–1969), they formed the Supreme Headquarters Allied Expeditionary Force, a vast army formed for Operation Overlord, the invasion of Europe. Mitchell's job was to educate the 21 Army medical officers in the correct use of penicillin for a range of different injuries. The lectures, demonstrations and memoranda were later published in an 80-page booklet *Memorandum on Penicillin Therapy*.<sup>24</sup> Porritt's introduction made it clear that the booklet was mainly written by Mitchell; he stated, 'the symposium... is rightly headed by the Adviser in Penicillin and Chemotherapy'. It was intended as a practical guide, based on its 'intensive use in this theatre of war'.

Mitchell's 50-page paper described the properties of penicillin followed by a detailed account of its use for all types of injuries and infections. Local application of penicillin was useful for soft tissue wounds or burns; however, more serious injuries required parenteral treatment. Three-hourly injections were painful and unpopular; Mitchell recommended an intramuscular penicillin drip as 'simple, safe, almost painless' – 100,000 units in 500 ml of saline, given by needle into the vastus lateralis or the pectoralis muscle from a 'time-marked bottle' would last for 24 h. Penicillin should be given to every injured soldier to prevent sepsis: 'given its proper place in the campaign to fight a malady it is capable of turning defeat into victory and, this is all important, if the hostile organisms are susceptible to penicillin'. However, penicillin is no substitute for good surgical practice; as Mitchell stressed in his introduction, 'it is not a panacea for every infection, adequate surgery and medical treatment are still essential, and the lavish expenditure of any chemotherapeutic agent will not purchase an indulgence for therapeutic sins'; prompt and careful surgery can save a life or a limb.<sup>25</sup> The *Memorandum* continued with a detailed section on correct surgical techniques for treating wounds and additional reports by specialists on dermatology, ophthalmology, venereology and laboratory techniques.<sup>26</sup>

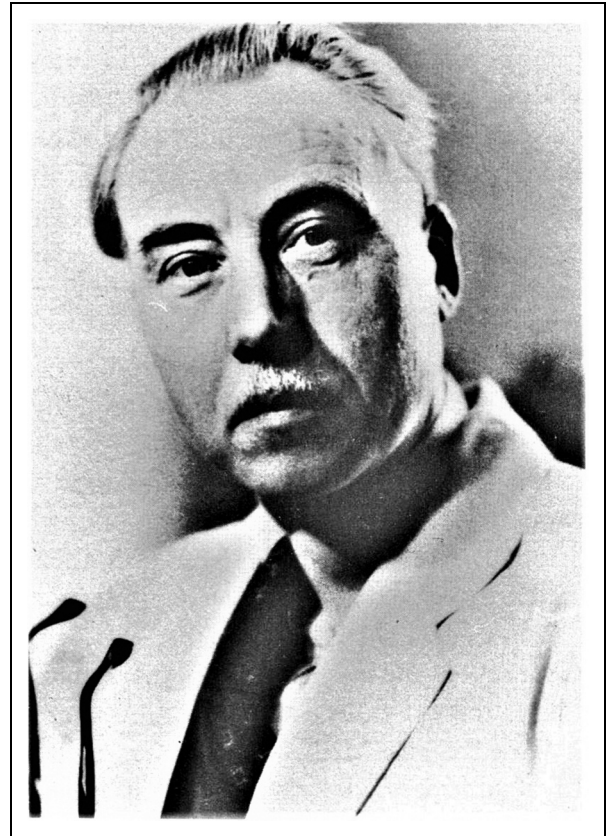
By June 1944, penicillin was being produced on an industrial scale in the United States.<sup>27</sup> The Allied invasion of Normandy included 8000 doctors, tons of medical equipment, 600,000 doses of penicillin and 50 tons of sulphonamides.<sup>28</sup> Mitchell landed in Normandy on D-Day, and was operational in North-East Europe until 8 May 1945, when hostilities ceased.<sup>29</sup> Shortly after, Porritt and Mitchell produced *Penicillin therapy and control in 21 Army Group*, 60 chapters authored by RAMC officers, including seven by Porritt and Mitchell, reporting the results of surgery and new techniques.<sup>30</sup> The publication was a record of the work of the RAMC staff in the field; an appendix of the surgical results validates their efforts: total cases, 50,201; deaths, 2564; recovered, 94.9%.

### Professor of anatomy (1946–1973)

After Mitchell was discharged in January 1946, he received a phone call from Professor JSB Stopford (1888–1961), Vice-Chancellor of Manchester University, asking if he would be interested in the chair of anatomy.<sup>31</sup> He was appointed as professor in October 1946 to replace Frederic Wood Jones (1878–1954).<sup>32</sup> The Medical School, indeed the whole University, had to adapt to severe constraints during the War, and Stopford (a former professor of anatomy) had extensive plans for the post-war development of the University. Professor Mitchell's brief was to restore normality to the undergraduate anatomy course, build up the staff and establish a viable research programme (Figure 1).<sup>33</sup>

The Victorian Medical School (1873) had been refurbished during the 1930s.<sup>34</sup> The dissection room (DR) was a large and well-lit room on the top floor and one of Mitchell's first acts was to replace the old dissection tables and ban smoking in the 'DR'.<sup>35</sup> Each cadaver was allocated four students who were tutored by demonstrators (studying for the FRCS exam) and tested each month by *viva voce*. The students had access to a large anatomy museum and also had additional lectures on systematic anatomy.<sup>36</sup> Notable members of the staff included Eugenia Cooper (1898–1991), lecturer in histology (1923–1965), recognised for her research on the endocrine glands and nervous system.<sup>37</sup> Thom Ashley (1913–1972) was a lecturer in embryology (1946–1972), and Edward Loudon Patterson (1910–1980), the senior lecturer, was a comparative anatomist and interested in the ANS and blood supply of nerves.<sup>38</sup>

Professor Mitchell was indefatigable in his research on the ANS; between 1935 and 1955, he published over 25 papers on the autonomic nerve supply to the main organs of the body, which was the basis for his DSc awarded by Aberdeen University.<sup>39</sup> The papers were compiled in his monographs, *Anatomy of the Autonomic Nervous System* (1953) and *Cardiovascular Innervation* (1955), both beautifully illustrated by a medical artist, Dorothy Davison (1809–1984).<sup>40</sup> His research workers included Edward Samuel (1921–1962), who helped to develop silver staining



**Figure 1.** Professor GAG Mitchell c.1960s (photograph and permission from the University of Manchester MMH). Abbreviations: GAG, George Archibald Grant; MMH, Manchester Museum of Medicine and Health.

techniques for nerves and Roger Warwick (1912–1991), who worked on the parasympathetic and oculomotor nerves of the eye.<sup>41</sup> Dr David ('Dan') Hoyte (1923–2004)<sup>42</sup> joined the staff in 1952 to research the embryology of the craniofacial bones. His obituary of Mitchell provides some insights into the Department; he described Mitchell as 'supportive,' the research was of 'high calibre,' and the staff, 'a melange of personalities, ideas, wit, and friendship'. Professor Mitchell was of course involved in many activities related to the University and anatomy: dean of the medical school (1955–1960); pro-vice chancellor (1959–1963); president of the Anatomical Society (1961–1963); president of the Manchester Medical Society (1964–1965) member of the board of governors of the United Manchester Hospitals, and president of the International Anatomical Nomenclature Committee.

The senior author's (PDM) personal experiences of the department was as one of three 'intercalated' BSc anatomy students (1966–1967). We had our own small research room and the assistance of a helpful technician. I was fortunate to have Professor Mitchell as my tutor and he also taught the group neuroanatomy.<sup>43</sup> Dr Patterson ran tutorials on comparative anatomy and was

a supervisor for my research project on the vagus nerve, always helpful and a vast source of anatomical knowledge.<sup>44</sup> The course included practical histology, electron microscopy and genetics taught by Dr Alan Emery.<sup>45</sup> The teaching and supervision were excellent, but the schedule was tight and we were expected to keep up, and not waste time or materials.

### Mitchell's reservoir penicillin syringe

Professor Mitchell was enthusiastic about medical history.<sup>46</sup> During the 1970s, he worked with Dr Frederic

Beswick (1925–2019), dean of the Medical School, and architect Harry Fairhurst (1925–2011) to include medical history museum display cabinets in the new Stopford Medical School Building (1973)<sup>47</sup>. Mitchell asked members of the Manchester Medical Society to donate old medical equipment and he donated his own collection of medical objects, one of which was a RAMC brass penicillin reservoir syringe, which is now on display in the Stopford Building foyer, home to the Medical School and MMH.

Working conditions were extremely difficult in the forward hospitals during the invasion; Harriet Low, an



**Figure 2.** Reservoir penicillin syringe (1945), storage box and instructions. 'D.52' means it was made 52 days after D-Day (photograph and permission from the University of Manchester, Manchester Museum of Medicine and Health).

army staff nurse in Normandy, recalled, 'I will never forget the bombing while we were there. At night, I used to lie on my tummy and watch the gunfire lighting up the sky'; so it is not surprising that glass syringes were easily broken and difficult to use for injections in the dark.<sup>48</sup> Lt. Col. Norman Logie RAMC (1904–1972), who was in one of the forward hospitals in Normandy, designed a metal reservoir syringe that could hold 20 cc of penicillin and was fitted with two valves, which allowed injections of exactly 1 cc to be given, even in a complete blackout (Figure 2). Major TJ Burness<sup>49</sup> of the Royal Electrical and Mechanical Engineers (REME) made the first model from an old telescope tube and called it 'D.39' meaning 39 days after D-Day. More syringes were improvised from other sources – Mitchell's was made from the oilcan of a Bren gun, and kept in a box marked 'REME Product Type D.52 MK II'.<sup>50</sup> The total number of syringes made is not recorded – Mitchell's is the only one known to have survived.<sup>51</sup>

## Discussion and summary

Those planning the Allied invasion were well aware of the high mortality from septic wounds. Penicillin was seen as an essential part of the RAMC plans, not just to reduce mortality but also to return injured soldiers to fighting fitness and boost morale.

Why was Mitchell chosen as penicillin adviser? There were other RAMC officers who had used penicillin during Florey's trials. Lt. Col. Pulvertaft had even manufactured his own crude penicillin; however, he was not a surgeon dealing with major injuries. Lt. Col. Ian Fraser was favoured by Florey, but instead he took command of the forward hospital at Bayeux. As already outlined, Mitchell had all the necessary qualities. He and Porritt had worked closely in Cairo since 1941, and when Porritt was promoted to Consultant Surgeon, he would have requested Mitchell as the Adviser in Penicillin.

It is important not to exaggerate Mitchell's contribution to the penicillin project. He was a key member of a complex organisation; however, there were thousands of RAMC staff involved, not only with penicillin but with other projects – blood transfusion, triage, sea and air evacuation, forward nursing teams and supplies, all had their 'Advisers'.

Penicillin was only an adjunct to good surgical treatment, but conditions could be challenging – the penicillin syringe is a testament that even giving an injection could be problematic. What Mitchell provided was a set of clear guidelines for those operating under battle conditions. The policy of giving every injured soldier a course of penicillin saved time, prevented sepsis and helped to streamline the management from admission to evacuation. Porritt summed up Mitchell's contribution:

In particular I would mention Lt. Col. GAG Mitchell (Adviser in Penicillin and Chemotherapy), to whom chief credit for this

brochure should rightly go, as by his sound common sense policy, his clear and astute direction and his engaging, cheerful personality, he has provided the incentive which has made the work so easy, for so many for so long.<sup>52</sup>

The skills required by a career anatomist include attention to detail, precise description, technical expertise and careful observation. Mitchell brought these qualities to his work during the War and later as professor of anatomy. He revitalised the Department and during the 1960–1970s, supported the introduction of a new integrated curriculum and helped in the design of the new Medical School. He retired in 1973, the year the Stopford Building opened. The MMH was established mainly by the joint efforts of the dean, Dr Beswick and Professor Mitchell. The Stopford Building no longer has the old-fashioned foyer display cabinets, they were dismantled in 2011 to make way for an increase in students, but the MMH is now actively engaged in educational projects and loans for exhibitions in the University, community, schools and other museums.

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## ORCID iD

Peter D Mohr  <https://orcid.org/0000-0001-9639-6545>

## References and notes

1. Mitchell GG. Obituary of GAG Mitchell. *British Medical Journal* 1993; 307: 121; University of Manchester Heritage Office. Recorded interview with George Grant Mitchell; typed transcript down-loaded 30 April 2018. Prof. Mitchell's son, George Grant Mitchell MB ChB FRCS MRCOG (1939–2020), was consultant obstetrician at Salford Royal Hospital.
2. University of Manchester Archive, GB 133 GGM/1-3.
3. AE Porritt and GAG Mitchell (eds) Penicillin therapy and control in 21 Army Group. The book was written in March 1945 and published by the Director of Medical Services, 20 May 1945. Available from <https://collections.nlm.nih.gov/catalog.nlm:nlmuid-10010970R-bk>; Mitchell GAG. The value of penicillin in surgery. *British Medical Journal* 1947; 1: 41–45.
4. Hoyte DAN. Obituary of Prof. George Archibald Grant Mitchell OBE TD ChM DSc FRCS. *Journal of Anatomy*

- 1993; 183: 639–641; Obituary of David Augustus Noel ('Dan') Hoyte, *British Medical Journal* 2005; 330: 604. David Augustus Noel ('Dan') Hoyte MB ChB (Manchester 1946) MD (gold medal 1959) MRCP (1978). Dan was an anatomy lecturer at Manchester, later Prof. of Anatomy in Jamaica and returned to do general practice in Derby.
5. Anonymous. Obituary of Alexander Low MD LLD. *British Medical Journal* 1950; 2: 1282. Scottish anatomist and anthropologist who measured growth and development in Scottish children; Anonymous. Obituary of Sir John Marnoch KCVO LLD MB CM. *British Medical Journal* 1936; 1: 290. Scottish surgeon, pioneered surgery for gastric ulcers. Lt. Col. in the RAMC 1st Scottish Hospital. Extra Surgeon to the King in Scotland.
  6. Learmonth JR. Surgery of the sympathetic nervous system. *British Journal of Surgery* 1937; 25: 426–445. Sir James Rognvald Learmonth CBE FRCSE trained in surgery at Glasgow Western Infirmary. He won a Rockefeller Scholarship to research nerve surgery at the Mayo Clinic. In 1949 he performed a lumbar sympathectomy on King George VI.
  7. Howie J. Professor Robert Douglas Lockhart MD FRSE (1894–1987). *British Medical Journal* 1987; 1: 1213. Scottish anatomist. Royal Navy Volunteer Reserve during the War. Graduated from Aberdeen in 1918. Professor of anatomy at Birmingham until he moved to Aberdeen in 1938. Curator of the Marischal Museum 1965–1979.
  8. Blair JSG. *Centenary history of the Royal Army Medical Corps*. Edinburgh: Scottish Academic Press, 1998, p.274; Obituary of Sir Percy Tomlinson DSO KBE FRCP Royal College of Physicians, *Munk's Roll* 1965; 5: 417.
  9. Hoyte. Note 4.
  10. Mitchell GAG, Logie NJ and Handley RS. Casualties from the Western Desert and Libya. *Lancet* 1941; 237: 713–716.
  11. Mitchell GAG and Buttle GAH. Proflavine powder in wound therapy. *Lancet* 1942; 240: 416–419; Proflavine in closed wounds. *Lancet* 1943; 242: 749; *ibid.*, Diflavine in wound therapy. *Lancet* 1943; 242: 287–289.
  12. Mitchell GAG, Rees WS and Robinson CN. Marfanil and Marfanil-Prontalbin. *Lancet* 1944; 243: 637–629.
  13. Fleming A. (ed.). *Penicillin its practical application*. London: Butterworth & Co., 1950; Bud R. Penicillin and the new Elizabethans. *British Journal History of Science* 1998; 31: 305–333; Special Issue on penicillin. *British Medical Bulletin* 1944; 2: 2–26.
  14. Ludovici LJ. *Fleming, discover of penicillin*. London: Scientific Book Club, 1952; Wainwright M. The mystery of the plate: Fleming's discovery and contribution to the early development of penicillin. *Journal Medical Biography* 1993; 1: 59–65; *Oxford Dictionary National Biography*. Sir Howard Walter Florey MB BS MD PhD FRS. Professor of pathology and Sir Ernst Boris Chain BSc PhD FRS. Lecturer in pathology at Oxford University. They were awarded the Nobel Prize in 1945 jointly with Sir Alexander Fleming.
  15. Chain E, Florey HW, Gardner AD, et al. Penicillin as a chemotherapeutic agent. *Lancet* 1940; 236: 226–228; Annotation. Penicillin. *Lancet* 1940; 236: 236.
  16. Abraham EP, Chain E, Fletcher CM et al. Further observations on penicillin. *Lancet* 1941; 238: 177–189. Editorial. Penicillin in action. *Lancet* 1941; 238: 191–192; Fleming A. Streptococcal meningitis treated with penicillin. *Lancet* 1943; 242: 434–438.
  17. Florey ME and Florey HW. General and local administration of penicillin. *Lancet* 1943; 241: 387–397; Editorials. Penicillin. *Lancet* 1943; 242: 546 and 242: 737–738; Pulvertaft RJV. Local therapy of war wounds. *Lancet* 1943; 242: 339–348; Wyatt HV. Robert Pulvertaft's use of crude penicillin in Cairo. *Medical History* 1990; 34: 320–326; Obituary of Robert James Valentine Pulvertaft OBE MRCS LRCP MRCP FRCP FRCPATH MD, Royal College of Physicians, *Munk's Roll* 1993; 9: 432–435. Director, later professor of pathology, Westminster Hospital (1931–1962).
  18. Florey HW and Cairns H. *Investigation of war wounds*. Penicillin, a preliminary report to the War Office and Medical Research Council on investigation concerning the use of penicillin in war wounds. War Office AMD.7/90D, October 1943, Welcome library, bound volume of pamphlets re penicillin treatment in the Second World War; Royal College of Surgeons. Sir Hugh William Cairns MB BS DM MD FRCS MA. Plarr's Lives of the Fellows on-line. London. Cairns was a neurosurgeon at the London Hospital and Professor of Neurosurgery at Oxford from 1937. He designed a mobile neurosurgical operating theatre for the North African deserts.
  19. Hedley-Whyte J and Milamed DR. Surgical travellers: Tapestry to Bayeux. *Ulster Medical Journal* 2014; 83: 171–177. Sir Ian Fraser FRSE PRCSI DSc DSO OBE. Eminent Irish surgeon at the Royal Belfast Hospital, president of the RCS Ireland, president of the BMA; Thomson S. Bacteriological examination of wounds treated with penicillin. *British Journal of Surgery* 1944; 32: 129–131.
  20. Florey and Cairns. Note 18, pp.18, 34 and 42.
  21. Clinical Trials Committee (MRC War Memorandum No.12). *The use of penicillin in treating war wounds*. London: HMSO, 1944 (reprinted 1945). The Committee included Fleming, Florey, and 14 other senior doctors from the Royal Colleges and the Armed Forces, Welcome library, bound volume of pamphlets re penicillin treatment in the Second World War.
  22. Florey and Cairns. Note 21, p.36.
  23. Royal College of Surgeons. Baron Arthur Espie Porritt MA MB BCh MCh PRCS CBE Bt. *Plarr's lives of the fellows on-line*. London: RCS England, 1997, pp.388–392; Woodfield G. and Romanos J. *No Ordinary Man: The remarkable life of Arthur Porritt*. Dunedin: Trio Books Ltd., 2008. Lord Porritt was born in New Zealand. He was an Olympic athlete (1924) and a pioneer of sports medicine. After the War he was surgeon to the Royal Family (1946–1967) and president of the RCS and BMA. He and Florey were awarded a gold medal by the BMA in 1964.
  24. Porritt AE and Mitchell GAG. *Memorandum on Penicillin Therapy in 21 Army Group*. Published by the Director of Medical Services, 21 Army Group, February 1945. Welcome library, bound volume of pamphlets re penicillin treatment in the Second World War.
  25. Mitchell GAG. Guide to penicillin therapy. Note 24, pp. 5–54 (the quotes are on pages 5, 16).
  26. Hellier FF (Dermatology), Lister A. (Ophthalmology), Cambell DJ. (Venereology). Note 24. pp.55–60 and Hughes KEA. Laboratory control of penicillin. Note 24, pp. 61–80.
  27. Quinn R. Rethinking antibiotic research and development: World War II and the penicillin collaborative. *American Journal Public*

- Health* 2013; 103: 426–434; Neushul P. Science, government and the mass production of penicillin. *Journal of History of Medicine & Allied Sciences* 1993; 48: 371–395.
28. Hedley-Whyte J. and Milamed DR. Note 19, p.173.
  29. Armed Forces War Records. <https://www.forces-war-records.co.uk/> (accessed 10 January 2021).
  30. Porritt AE and Mitchell GAG. Penicillin therapy and control. Note 3.
  31. Hoyte DAN. Note 4.
  32. Royal College of Surgeons. Frederic Wood Jones MB ChB FRCS DSc FRS. *Plarr's lives of the fellows on-line*. London: RCS England. Prof. of anatomy at Royal Free Hospital (1912–1919). Moved abroad to Australia. Prof. of anatomy at Manchester (1939–1945), after retirement he was elected as Conservator at the RCS Hunterian Museum.
  33. Robertson AB and Lees C. The University of Manchester 1918–1950. *Bulletin John Rylands Library* 2002; 84: 447–532; Beswick FB. John Sebastian Bach Stopford MB ChB KBE MD ScD LLD FRCP FRS in: Elwood WJ and Tuxford AF. *Some Manchester Doctors*. Manchester: Manchester University Press, 1984, pp.151–157. Stopford's main interest was neuroanatomy. He was twice dean of the Medical School (1923–1927 and 1931–1933), chairman of the Manchester Joint Hospital Board (1935–1948), chairman of the Regional Hospital Board and active on many other committees related to medical education.
  34. Stopford JSB. Department of Anatomy, University of Manchester. *Methods and problems in medical education (16th series)*. New York: Rockefeller Foundation, 1930, pp.1–9. For history of the Manchester Medical School see, Butler S. Transformation in training: the formation of University Medical Faculties in Manchester, Leeds, and Liverpool, 1870–1884. *Medical History* 1986; 30: 115–132.
  35. Hoyte DAN. Note 4.
  36. Alberti SJMM. *Morbid curiosities*. Oxford: Oxford University Press, 2011; Mitchell GAG and Patterson EL. *Basic Anatomy*. Edinburgh: E&S Livingstone Ltd., 1954, this was the main textbook used to support the lectures.
  37. Shreeve DR. Dr Eugenia Rose Aylmer Cooper (1898–1991): Manchester renowned female anatomist and neurohistologist. *Journal of Medical Biography* 2014; 24: 492–499. ERA Cooper MB ChB MB DSc published: *The histology of the more important human endocrine organs*. London: HS Milford, Oxford University Press, 1925 and *Human histology, a guide for medical students*. London: HK Lewis & Co., 1939 and 1946.
  38. UoM archive 133 MMC/2/Ashley. Geoffrey Thomas Ashley BSc MB ChB (1939) MD, RAMC in Burma 1940–1945, anatomy demonstrator 1946–1972, seconded to Uganda 1948–1950; UoM archive 133 MMC/1/2/Patterson EL. Sources of arterial blood supply to the superior and middle cervical sympathetic ganglia and ganglion intermédiaire. *Journal of Anatomy* 1950; 84: 329–341. EL Patterson BSc MB ChB (1934) MD (Manchester, gold medal 1944).
  39. Mitchell GAG. For example: innervation of the distal colon. *Edinburgh Medical Journal* 1935; 42: 11–20; The renal nerves. *British Journal Urology* 1950; 22: 260–279; Innervation of the heart. *British Heart Journal* 1953; 15: 159–171.
  40. Mitchell GAG. *Anatomy of the autonomic nervous system*. Edinburgh: E&S Livingstone Ltd., 1953; Cardiovascular innervation. Edinburgh: E&S Livingstone Ltd., 1956. List of Mitchell's papers, p.329; Mohr PD. Dorothy Davison (1890–1984): Manchester medical artist and her work for Geoffrey Jefferson (1886–1961). *Journal of Medical Biography* 2017; 25: 130–137.
  41. Obituary, Edward Peter Samuel MB ChB (Manchester 1945) MSc MD. *British Medical Journal* 1962; 2: 995–996. Dr Samuel was registrar at Ancoats Hospital in Manchester, then researcher in anatomy; later he went into general practice; Obituary, Professor Roger Warwick BSc MB ChB (Manchester 1937) PhD MD. *Journal of Anatomy* 1992; 180: 553–554. Surgeon Commander in RNVR, lecturer in anatomy 1945, Prof. of Anatomy at Guy's Hospital 1955, co-editor of Gray's Anatomy 1974–1989.
  42. Hoyte DAN. Note 4.
  43. Mitchell GAG. *The essentials of neuroanatomy*. Edinburgh: E&S Livingstone Ltd., 1966.
  44. Mohr PD. Blood supply of the vagus nerve. BSc Thesis. University of Manchester, 1967; *ibid.*, Blood supply of the vagus nerve. *Acta Anatomica* 1969; 73: 10–26.
  45. UoM archive 133 DMG. Alan Eglin Heathcote Emery MB ChB PhD FRCP FRCPE lecturer/reader in genetics at Manchester (1964–1968), professor of human genetics at Edinburgh (1968–1983).
  46. Mitchell GAG. *The story of anatomy in Scotland*. Aberdeen: Aberdeen University Press, 1938; *ibid.*, Resurrection days. *Manchester University Medical School Gazette* 1948; 27: 150–154.
  47. Beswick FB. A hundred years of progress. *Manchester Medical Gazette* 1973; 53: 4–6. Dr Frederic Bakewell Beswick MB ChB, lecturer in physiology. As executive dean of the Medical School he oversaw the construction of the new Stopford Building (1960s–1973) and later was bursar of the University; Mohr PD, and Jackson WA. University of Manchester Medical School Museum: collection of old instruments or historic archive? *Bulletin of the John Rylands University Library of Manchester* 2005; 87: 209–223; MMH records. 1.722 F2 D2 Mitchell; penicillin syringe 1999.121. The syringe is part of an exhibition, 'Instruments of Change' (2019). Instruments of Change exhibition | University of Manchester.
  48. British Army Nurses. Low, Harriet Isabella. Available from <https://britisharmynurses.com/low-harriet-isabella/> (accessed 24 March 2021).
  49. Burness TJ. Special penicillin syringes. Note 3: 361–362; Obituary, Norman John Logie TD MB FRCS FRCSE. *British Medical Journal* 1972; 1: 596–597. NJ Logie graduated from Aberdeen Medical School in 1927. During the War he served in the 15th (Scottish) Hospital in Cairo treating burns. After the War he specialised in urology at Aberdeen Royal Infirmary.
  50. Mohr PD. Reservoir multidose penicillin syringe. *Bulletin of History of Medical Equipment Society* 2007; 18: 10–12.
  51. Baxter B. Technical historian, REME Museum. Personal communication; email, 16 April 2013.
  52. Porritt AE. Introduction. Note 3, pp.3–6.



## Author biographies

**Peter D Mohr** is a retired neurologist from the Salford Royal Hospital and an Honorary Lecture in Medicine. He also studied medical history at the Manchester Centre for the History of Science, Technology & Medicine and was the honorary curator of the MMH 2002–2011 and now acts as honorary advisor and volunteer.

**Stephanie Seville** is the present MMH's Heritage Officer who is linked to the University Office of Social Responsibility and has developed and expanded the Museum's outreach work in the community, local schools and museums, since 2013.

# Dr JA Gray (1858–1929)–Surgeon to HH The Amir of Afghanistan

Simon Gray<sup>1</sup> 

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## Abstract

Dr Gray was an assistant medical officer at the Islington Workhouse when he was offered the dangerous but well-paid post as surgeon to the Amir of Afghanistan in August 1888. He arrived in Afghanistan in March 1889 and continued in the post until June 1893. He described his experiences in his book, *My Residence at the Court of the Amir*.

## Keywords

Afghanistan, Amir, Abd al-Rahman, Islington Workhouse, India, cholera

## Introduction

My grandfather's book, *My Residence at the Court of the Amir*, was published by Richard Bentley & Son in 1895. A second edition was published in 1901, after the death of the Amir, by Macmillan (who had taken over Bentleys), when the title was shortened to *At the Court of the Amir*. For many years, the book was required reading for the Indian Civil Service. As Afghanistan came into the news more recently several facsimile editions were produced. Copies can be found in book shops but the book can now be read or downloaded online free of charge from a variety of sources.

The purpose of this article is to provide additional information, not in the book, and to provide a background to Dr Gray's adventures based on family information and on research in India Office records.

## Who was Dr Gray and why did he go to Afghanistan?

John Alfred Gray was the second son of Dr Thomas Scott Gray of Islington. Alfred and his older brother, Thomas, were educated at the City of London School and both started their medical training at St Bartholomew's Hospital in September 1876. Thomas qualified for

Membership of the Royal College of Surgeons (MRCS) Licentiate of the Royal College of Physicians (LRCP) in 1884. Their father died in June 1885 and, as the elder son, Thomas Gray succeeded to the practice.

Alfred Gray had to earn enough money to purchase or set up a practice on his own. After passing MRCS in 1882 he became a registered medical practitioner on 8 December 1882. His first employment was as an assistant to Dr John Harris Rose who practiced in Brighton. He then applied for the post of Assistant Medical Officer at St Mary's Infirmary which was part of the Islington Workhouse, where he commenced work on 17 May 1883. He passed the bachelor of medicine (MB) qualifications at London University and also the Licentiate of the Society of Apothecaries in 1884.

The Islington Workhouse and St Mary's Infirmary were managed by the Islington Board of Guardians under the chairmanship of Richard Wiltshire. There was accommodation for 866 able-bodied and unemployed inmates in the Workhouse and for 540 of the sick poor in the Infirmary.

<sup>1</sup>Retired Chartered Accountant, Portsmouth, Hampshire, UK

### Corresponding author:

Simon Gray, 15 Victory House, Port Solent, Portsmouth, Hampshire, UK.  
Email: simongray15@icloud.com