

**Pharmacy and the Great War:  
The ‘Anti-Microbe Corps’, gas masks and ‘Forced March’ tablets**

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*Introduction*

At the start of the Great War pharmacy and the pharmacy profession were as unprepared as everyone else. There was still heavy reliance on drugs of plant origin, and the new chemical drugs were all imported from Germany. Pharmacists shared the patriotic enthusiasm of their countrymen, but the profession had very few female members able to take their places if the men went off to war. But pharmacists were nothing if not inventive, and they quickly adapted to the new situation.

This paper explores the role that pharmacy, pharmacists and others involved in making and supplying medicines played in the First World War. It has three main sections; firstly, the Government’s call to arms and how pharmacists responded to it; secondly, the impact of the war on pharmacy on the home front, and particularly the impact on business and the role of women; and thirdly, the role of the pharmaceutical industry, including the development of the gas mask.

*The Call to Arms*

The day after Britain declared war on Germany, on 5 August 1914, a full-page advertisement appeared in newspapers with the slogan ‘Your King and Country Need You’. It was the first of many. Lord Kitchener, Secretary of State for War, had the task of recruiting a large army to fight Germany. On 5 September a picture of him pointing at the viewer appeared on the front cover of a popular magazine, *London Opinion*, over the order ‘Join Your Country’s Army.’

The response of the pharmaceutical community, as indeed of the whole country, was overwhelming. Large numbers of chemists and druggists, and others engaged in the medicines trade in different ways, signed up for service with ‘The Colours’ (i.e. the army). With the start of the war both the *Pharmaceutical Journal* (the official organ of the Pharmaceutical Society of Great Britain, henceforth the *Journal*) and the *Chemist & Druggist* (the trade journal for community pharmacists) began weekly news features to keep their readers informed, the *Journal* under the heading ‘War Notes and News’ and the

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*Chemist & Druggist* under the heading ‘European War.’ Both published the names of those enlisting.

On 22 August 1914 the *Journal* reported that ‘Mr C. H. Hampshire of University College Hospital London and Mr Stephen F. Webb of Evans Sons Lescher and Webb are on active service as members of the Honourable Artillery Company. Mr M.G. Smith of Lewisham Infirmary has joined 5<sup>th</sup> Battalion Royal West Kent Regiment’. On 29 August it reported that ‘Mr W. Ford of Maidstone was called up to serve with the RAMC,’ and that ‘Mr A. Bate, of Bate and Gorst, has been asked by the War Office to do temporary duty as dispenser at Bowerham Barracks, depot of Kings Own Lancashire Regiment, 1<sup>st</sup> battalion doing duty in Belgium and France’. The *Square Chronicle*, the magazine of the Pharmaceutical Society’s School of Pharmacy in London, published a roll call of past students serving with the Colours.<sup>1</sup>

On 19 September 1914 the *Chemist & Druggist* published its first Pharmaceutical Roll of Honour, encompassing ‘all those connected with pharmacy and the drug trade who are now serving with the British army,’ and including staff released from the chemical and drug trades.<sup>2</sup> It listed several hundred names. A second list appeared the following week, and thereafter it appeared weekly. On 2 January 1915 the *Chemist & Druggist* reported that over 2,000 names had appeared on the Roll since it started. The eightieth (and final) Roll, listing five names, appeared on 1 April 1916. Thereafter the names of those enlisting appeared under its ‘European War News’ section. In all, the list included several thousand names.

### ***Pharmacists as military dispensers***

Pharmacists enlisting usually expected to do so as soldiers in the army. Some, however, hoped to make use of their pharmaceutical knowledge. Four days after the declaration of war the *Journal* published an announcement under the heading ‘pharmacists as military dispensers’. It read: ‘In reply to inquiries which are being received from pharmacists who are desirous of taking service as military dispensers during the war, we are enabled to state that the conditions of such service are laid down in a special Army Order issued this week, dealing with the ‘enlistment of civilians for temporary service during the war.’ Men enlisted under this Army Order must not be more than forty years old, and enlistments will be for one year, or if the war lasts longer, for the duration’.<sup>3</sup>

‘Pharmacists desirous of appointment to the RAMC, who are qualified dispensers, will be required to produce the Minor Certificate of the Pharmaceutical Society.’ (The Minor Certificate was the lower qualification

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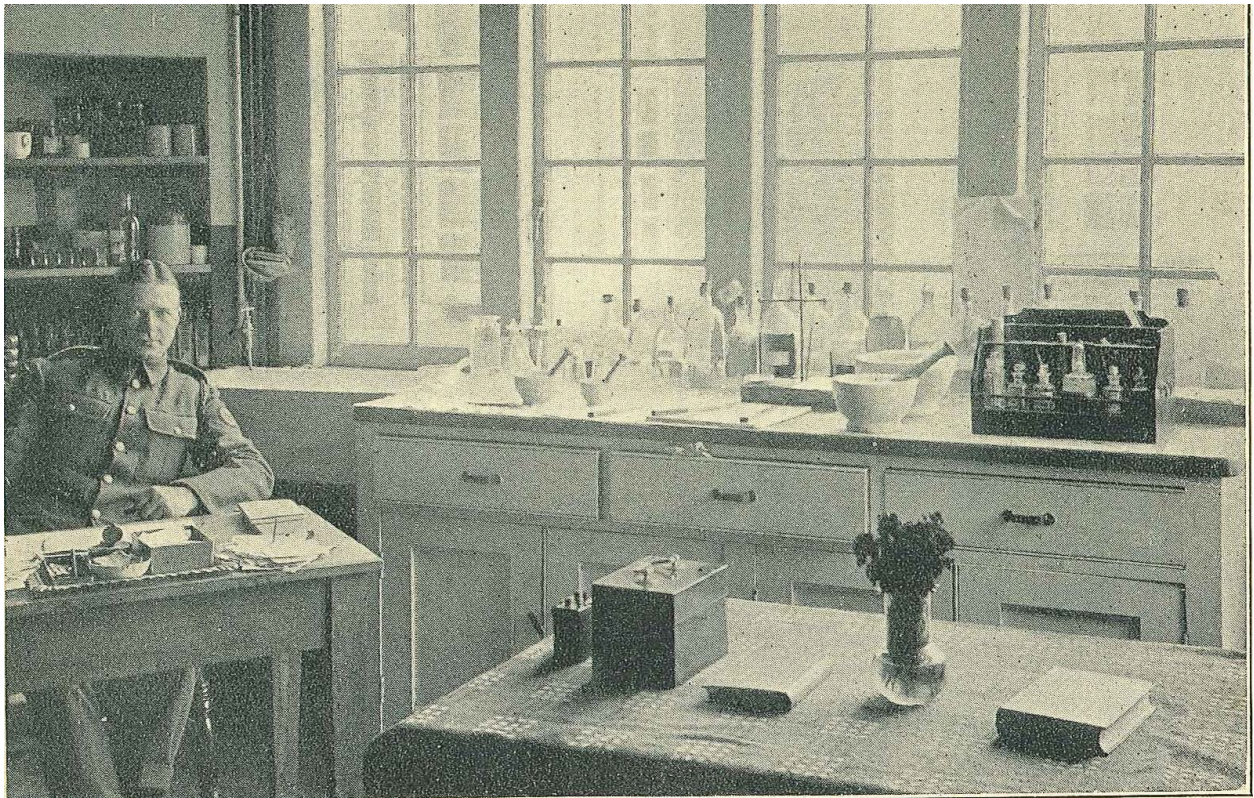
<sup>1</sup> Anon, ‘The Square Chronicle: a War Number’, *Pharmaceutical Journal*, 93 (28 November 1914), 737.

<sup>2</sup> Anon, ‘Our Roll of Honour’, *Chemist & Druggist*, 85 (19 September 1914), 34-36.

<sup>3</sup> Anon, ‘Pharmacists as Military Dispensers’, *Pharmaceutical Journal* 93, (8 August 1914), 218.

obtained by chemists and druggists working in chemists' shops; the Major Certificate was a higher qualification obtained by the much lower number of pharmaceutical chemists.) It continued: 'they should communicate with the nearest recruiting officer, and must enlist without conditions as ordinary privates. They should however intimate in what capacity they desire to serve. We are informed that the services of 150 dispensers will be required, and that not more than 50 of these will be expected to serve with any expeditionary force that may be sent out of the country'.

The requirement to enlist as ordinary privates generated a heated debate in the letter columns of the *Journal*. Henry Morgan hoped that 'pharmacists will not enlist unconditionally, for if they are willing to work under the RAMC corporal during times of war, they must not be surprised at RAMC men insisting on being registered as full-blown chemists without examination during times of peace.' More patriotic voices prevailed: James Grier wrote that 'the present is not the time for arguments, but for service.'<sup>4</sup>



Lance-Corpl. H. J. Hancox, Military Dispenser, in his Dispensary at Herne Bay.

<sup>4</sup> J. Grier, 'Pharmacists and the RAMC', *Pharmaceutical Journal*, 93 (5 September 1914), 363.

### *Army Pharmaceutical Corps*

Pharmacists could not gain commissions unless they joined the forces as combatants. Their rank and status in the armed forces remained a contentious issue throughout the war. The argument even spread to the national newspapers. In the *Daily Chronicle* of 3 April 1915, a letter from an RAMC lieutenant was published urging that ‘warrant rank at least should be granted to men holding the Pharmaceutical Society’s certificate’.<sup>5</sup>

At the time William Glyn Jones (later Sir William), a pharmacist, was Liberal MP for Stepney. During the war he was Parliamentary Secretary to the Ministers of Munitions and Reconstruction. There were thus close links between the Society and the government, and the question of the employment of pharmacists in the Army was regularly raised by Glyn Jones. The Society lobbied the government to establish an Army Pharmaceutical Corps with its own commissioned ranks.<sup>6</sup> But all such proposals were resisted by the army. Only minor concessions were obtained; in 1916 the title ‘sergeant dispenser’ was replaced by ‘pharmacist’ in official communications.<sup>7</sup>

Those who did enlist undertook highly varied duties during the war. Many of these experiences, from the routine of basic training and active service in France, to service in casualty clearing stations and military hospitals, were shared with readers of the two journals. On 12 September 1914 the *Journal* published ‘A chemist’s assistant’s experience at the Battle of Mons’.<sup>8</sup> Immediately after the war the *Chemist & Druggist’s* readers were invited to contribute their stories to a new series, *Experiences of the Great War*. In all thirty-six contributions were published. The first, ‘Pharmacy in the Near East’, appeared on 23 November 1918; the last ‘With the Sanitary Corps’ on 17 April 1920.<sup>9</sup>

### *Casualties and honours*

Soon after the declaration of war the first casualties were reported. The first person reported ‘killed in action,’ in the *Chemist & Druggist* on 20 September 1914, was William Sherrington, of the South Lancashire Regiment, who was previously employed by Lewis and Burrows of Holborn, London. More positively, the *Journal* reported on 26 September 1914 that ‘the only one connected with pharmacy whom we know to have participated in the battle at

<sup>5</sup> Anon, ‘Letters’, *Daily Chronicle*, (3 April 1915), 3.

<sup>6</sup> S.W.F. Holloway, *Royal Pharmaceutical Society of Great Britain 1841-1991: A Political and Social History* (London, The Pharmaceutical Press, 1991), p. 354.

<sup>7</sup> S.W.F. Holloway, *Royal Pharmaceutical Society of Great Britain*, p. 359.

<sup>8</sup> Anon, ‘A chemist’s assistant’s experience of the Battle of Mons’, *Pharmaceutical Journal*, 93 (19 September 1914), 414.

<sup>9</sup> Anon, ‘Experiences of the Great War: With the Sanitary Corps’, *Chemist & Druggist*, 92 (17 April 1920), 47.

Mons is 2<sup>nd</sup> Lt John Ransom, PhC FCS, son of Mr Francis Ransom of Hitchin. He was safe and well when last heard of.<sup>10</sup>

As the weeks passed so more and more casualties were reported. Some had been wounded and others taken prisoner. In fact many of those originally listed as missing were later reported as being prisoners of war in Germany. On 31 October 1914 the *Journal* reported that 'Private Frank Miller of 1<sup>st</sup> Battalion Royal Scots Fusiliers figures amongst the wounded'. He had been twice wounded in one of the recent battles.

From the beginning of 1915 the list of those killed increased significantly. On 2 January 1915 the *Chemist & Druggist* reported that Harold Alexander Holme and Private James Miller had both been killed in action; and on 9 January that Lance-Corporal Walter Cairns Black, chemist and druggist, had been killed by a German sniper in the Flanders trenches on 22 December 1914.

Casualties were reported separately in the 'deaths' column of the *Chemist & Druggist*. War deaths were reported virtually every week, sometimes with as many as a dozen names appearing. From 15 January 1916 they were listed under three separate headings; 'killed in action', 'died on active service' (from effects of gas-poisoning or shell-shock) and 'died of wounds'.<sup>11</sup> One of the last to be listed was Captain Bruce Macdonald Brander, who died in France on 30 November 1918. He had been assistant editor of the *Chemist & Druggist*.<sup>12</sup> Pharmacists continued to be reported as 'killed on active service' for several months after the Armistice; the last name appeared on 29 March 1919.

Many of those whose names appeared on the Pharmaceutical Roll of Honour distinguished themselves with acts of heroism and courage. By 1918 reports were appearing regularly of those receiving honours and awards, including the Military Medal and the Distinguished Service Order. Others received the Croix de Guerre of either France or Belgium. On 12 January 1918 the *Journal* reported that Major J.H.B. Wigginton, ASC, had been awarded the Military Cross for gallantry. He had previously been manager of the Drug and Perfumery Department of Harrods; he had originally been called up with Territorial Forces, and wounded in the Battle of the Somme.<sup>13</sup>

### *The Home Front*

Whilst many pharmacists enlisted in the armed forces and served as combatants or dispensers, many others stayed at home, maintaining pharmaceutical services

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<sup>10</sup> Anon, 'War Notes and News', *Pharmaceutical Journal*, 93 (26 September 1914), 496.

<sup>11</sup> Anon, 'Deaths-killed in action, died on active service, died of wounds', *Chemist & Druggist*, 97 (15 January 1916), 40.

<sup>12</sup> Anon, 'Deaths: Captain Bruce Macdonald Brander', *Chemist & Druggist*, 101 (30 November 1918), 34.

<sup>13</sup> Anon, 'War Notes and News', *Pharmaceutical Journal*, 98 (12 January 1918), 94.

as best they could. Some wished to serve their country without enlisting, and the removal of so many men created opportunities for women.

After war had been declared there was an immediate demand from men over military age for a means of serving their country. These included many pharmacists. The result was the spontaneous formation of unofficial volunteer defence associations around the country. By September 1914 a central committee had been formed, and on 19 November the War Office recognised a Central Association of Volunteer Training Corps (VTCs); however they did not recognise the individual Volunteer Training Battalions. Units had to be financially self-supporting, and members had to provide their own uniforms.<sup>14</sup>

### *The Pharmacists Volunteer Training Corps*

On 18 July 1915 a meeting was called by the London Pharmaceutical Association to discuss the possibility of forming a Corps made up entirely of pharmacists. Virtually all eighty of those present signed the Roll, becoming the first members of the Pharmacists Volunteer Training Corps. The aim of the new Corps was to provide a company ‘trained in sanitation, ambulance work, chemistry and analysis.’ It quickly became attached to the Central London Volunteer Regiment, which contained the 1<sup>st</sup> to 4<sup>th</sup> Battalions of the County of London Volunteer Training Corps.<sup>15</sup>

Along with other Volunteer Corps the pharmacists became exasperated with the Government’s refusal to recognize them as part of His Majesty’s Forces. In an attempt to prove themselves to the authorities the Corps planned an exhibition of their skills, equipment and sanitary appliances. The *Journal* published an appeal to members to take part in the show, which was to be held at Brockwell Park, London, on Sunday, 15 October 1916. The inspection was to be carried out by Brigadier General the Hon. Francis Charles Bridgman, commandant of the central group of the London Volunteer Regiment of the Volunteer Training Corps.<sup>16</sup> The hope was that the War Office would give the Corps official recognition as the Pharmacist Sanitary Company for London.

The exhibition was a great success; it was reported in several London papers, and a film made by Pathé News was shown throughout the country.<sup>17</sup> The *Daily Express* christened them the ‘Anti-Microbe Corps’. But despite the success of the exhibition and the praise of the inspectors, the War Office decided that recognition could not be given to any non-combatant unit. They

<sup>14</sup> I.F.W. Beckett, *A Nation in Arms: A Social Study of the British Army in the First World War* (Manchester, Manchester University Press, 1985), p. 15.

<sup>15</sup> R.A. Westlake, ‘The London Pharmacist Volunteers 1915-17’, *Bulletin of the Military Historical Society*, XXXII, 126 (1981), 60-63.

<sup>16</sup> *The London Gazette*, no. 29766 (26 September 1916), 9457.

<sup>17</sup> Anon, ‘Every Man A Qualified Chemist’-Brigadier General Bridgeman inspects the Pharmacist VTC (Volunteer Training Corps) in Brockwell Park, London – 1916’. *Pathé News film* (1916) Available at <http://www.britishpathe.com/video/every-man-a-qualified-chemist/query/pharmacist>

were given the choice of disbanding or converting to combatant training. Eventually they became 'D' Company of the United Arts Rifles, which formed the 1<sup>st</sup> County of London Volunteer Regiment.

The Pharmacist Volunteers survived in their role as infantry soldiers until the end of the war, having become efficient in the skills of 'company and battalion drill, bayonet fighting, bombing, machine gun work, signaling, musketry and rifle drill.'<sup>18</sup>

### *Pharmacy, War and Women*

The need for ever more fighting men at the Front meant that those engaged in non-combatant roles were often removed from them. In April 1916 the *Chemist & Druggist* reported under the heading 'Military hospital dispensers' that 'the Army Council has issued an Order to the effect that the male staff of all the military hospitals is to be reduced as far as possible, and that the services of men are to be replaced by women.' It noted that 'men dispensers are not considered indispensable, and even though they may be far beyond military age are to be dismissed and their places taken by women. There are not of course any women pharmacists to be had for this work, but it is held in the Army that the Apothecaries Hall assistant's qualification is good enough for dispensers in military hospitals'.<sup>19</sup> The Apothecaries Hall certificate was awarded to those normally working as dispensers in shops or hospitals under the supervision of a pharmacist.

The First World War made the female workforce visible in pharmacy, as they filled roles vacated by men called up for service.<sup>20</sup> But their numbers were small; although in 1891 5 per cent of chemists and druggists were women, by 1908 the number on the register had fallen to 160, about 1 per cent of the total. Of these, only two-thirds practiced pharmacy, and of these 60 per cent worked in hospitals and institutions, and around 20 per cent in retail pharmacy.<sup>21</sup> An Association of Women Pharmacists was formed in 1905, giving women pharmacists a voice and a platform.

In January 1916 a correspondent to the *Journal* wrote 'to say that only now women are coming to the forefront in usefulness sounds like the sudden awakening of a slumberer to economic consciousness. They have for a long time played in most pharmacies a great and successful part, and the abnormal demand arising, as it naturally does in wartime, does so in the first instance

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<sup>18</sup> R.A. Westlake, 'The London Pharmacist Volunteers 1915-17', *Bulletin of the Military Historical Society*, XXXII, 126 (1981), 61.

<sup>19</sup> Anon, 'Military Hospital Dispensers', *Chemist & Druggist*, 88, 1892 (29 April 1916), 35.

<sup>20</sup> B. Hudson, *The School of Pharmacy, University of London: Medicines, Science and Society 1842 to 2012* (London, Academic Press, 2013), p. 85.

<sup>21</sup> S.W.F. Holloway, *Royal Pharmaceutical Society of Great Britain 1841-1991: A Political and Social History* (London, The Pharmaceutical Press, 1991), p. 265.



**“Dispensing Staff outside the store”, King George V Military Hospital, Stamford Street, London**

principally because they have been ready and eager and fit to step into the breach...’<sup>22</sup> Other women expressed equally strident views. In December 1917 Agnes Borrowman declared that ‘during the last ten years women in pharmacy have proved by their college careers that they have enthusiasm, that they intend to take first place, that nothing less will satisfy them. Unless I am very much mistaken, the same enthusiasm and determination will carry them through in the business world into which this war has given them entry.’<sup>23</sup>

By 1917 men were in short supply everywhere, and drug companies saw a dramatic shift in the gender balance of their workforces. In 1914 Boots employed a total of 9,343 staff, of whom 5,484 were men and 3,859, or about 40 per cent, were women; by 1917 the total employed had reached 12,339, made up of 4,863 men and 7,476, or around 60 per cent, women.<sup>24</sup> Beechams at St Helens were obliged to engage women for the first time. The welfare officer at the factory selected seventeen girls, ‘those who had clean finger nails, and

<sup>22</sup> Anon, ‘Letter’, *The Pharmaceutical Journal*, 96 (3 January 1916), 42.

<sup>23</sup> A. Borrowman, ‘Letter’, *The Pharmaceutical Journal*, 99 (10 December 1917), 45.

<sup>24</sup> S. Chapman, *Jesse Boot of Boots the Chemists* (London, Hodder and Stoughton, 1974), p. 102.



wherever possible, piano-playing experience, since agile fingers on the keyboard were expected to be equally agile on the packing line.’<sup>25</sup>



### **Agnes Borrowman (1881-1955)**

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<sup>25</sup> A. Francis, *Worth a Guinea a Box: A Biography of Thomas Beecham* (London, Robert Hale Ltd, 1968), p. 140.

### *Business as usual*

A few days after the declaration of war the *Chemist & Druggist* offered a motto for the British drug trade; ‘Keep cool, be economical with everything you buy and sell, and help the country by not yielding to the temptation of profiting yourself in the time of the Nation’s trial’.<sup>26</sup>

Running a business in wartime was undoubtedly challenging, but it could have been a lot worse. Reviewing progress after one year, an editorial in the *Chemist & Druggist* noted that ‘at the end of a year’s war pharmacists have much for which they can be thankful. The business of pharmacy has not been disorganized to the same extent as many other businesses, and taking the country as a whole, pharmacists are not less prosperous than they were before the war began. For this we ought to be grateful.’<sup>27</sup>

For many community pharmacies business was brisk during the war. The experience of Boots the Chemists, the Nottingham based drug company that had been established by Jesse Boot, was not untypical. Boot’s response to the war was to produce a range of goods for the ‘men at the front.’ These included water sterilisers, anti-fly cream, vermin powder, and a packet case of compressed medicines (including quinine and phosphorus tablets). Boots retail sales, which approached £3 million in 1914, exceeded £5 million in 1918, although this was partly due to a fall in the value of money during the war.<sup>28</sup> The number of Boots branches increased by thirty, from 560 in 1914 to 590 in 1918.

The Pharmaceutical Society’s school of pharmacy continued to operate during the war, although with a smaller number of students. There was also an increase in the number of women students.<sup>29</sup> Women students had first been admitted to the Society’s school of pharmacy in 1875, and slowly more and more were admitted at other schools. By 1920, 7 per cent of the names on the Register of Pharmaceutical Chemists and Chemists and Druggists were women. Women also increased their representation on the staff of schools of pharmacy. Ivy Roberts was first admitted as an undergraduate to Manchester University’s Pharmacy Department in 1914 and graduated with a first class division BSc in 1917; she was appointed as an assistant lecturer in the department in 1919. She was only the fourth woman and the first Manchester student to receive the Society’s prestigious Pereira Medal for best student.<sup>30</sup> Manchester also appointed Jeanette Duncan as a demonstrator in the same year.

<sup>26</sup> Anon, ‘European War’, *Chemist & Druggist*, 85, 1802 (8 August 1914), 35.

<sup>27</sup> Anon, ‘End of a Year’s War’, *Chemist & Druggist*, 95, 2701 (24 July 1915), 98.

<sup>28</sup> S. Chapman, *Jesse Boot of Boots the Chemists* (London, Hodder and Stoughton, 1974). p. 90.

<sup>29</sup> B. Hudson, M. Boylan, *The School of Pharmacy, University of London: Medicines, Science and Society, 1842-2012* (London, Academic Press, 2013), p. 84.

<sup>30</sup> B. Robinson, *The History of Pharmaceutical Education in Manchester* (Manchester, University of Manchester Press, 1986), p. 126.

### ***Medicine, War and Innovation***

War is a stimulus for innovation and invention, and developments in medicine and pharmacy during the First World War were no exception. The war presented many challenges; preventing disease, treating the sick, and dealing with casualties. Whilst doctors devised new methods of treatment, weapons designers found new ways to injure and kill. For pharmaceutical manufacturers there were opportunities presented by large government contracts; and for community and hospital pharmacists there were challenges of shortages and restrictions.

By the start of the First World War, developments in microbiology had led to the use of mobile bacteriological units, which significantly lessened the effect of disease on the fighting forces. Medicalized field dressings and X-rays had been used in the Boer War, although initially the machines were large and cumbersome and could only be used in hospitals. However, they had been much improved by the time of the First World War. The nature of wounds changed, requiring new types of treatment. Blood transfusions were performed in the battlefield, and saline transfusions for fluid loss were also used. Pharmaceuticals were needed at the Front line.

Other measures used during the First World War to prevent the spread of infectious diseases included the use of tetanus antitoxin and vaccination against typhoid, although this was voluntary.<sup>31</sup> There were important developments in orthopaedics, neurosurgery and psychiatry. Developments on the battlefield in these specialties were later used to treat the civilian population.

### ***Pharmacy, War and Innovation***

The British-based fine chemicals industry received a considerable boost in 1914 with the need to replace chemicals previously imported from Europe. On the eve of the war German firms such as Bayer, Hoechst and Cassella dominated the pharmaceutical industry. With the outbreak of war Britain closed down subsidiaries of German companies, suspended German trademarks and patents, and ceased to import German products.<sup>32</sup>

British companies were prompted by the government to produce replacements for drugs such as the arsenical, Salvarsan, discovered by Ehrlich

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<sup>31</sup> I.R. Whitehead, *Doctors in the Great War* (Barnsley, South Yorkshire, Leo Cooper, 1999), p. 221-30.

<sup>32</sup> R. Church, E.M. Tansey, *Burroughs Wellcome & Co: Knowledge, Trust, Profit and the Transformation of the British Pharmaceutical Industry 1880-1940* (Lancaster, Crucible Books, 2007), p. 255-6.

in Germany in 1909.<sup>33</sup> A 1916 Royal Commission reported that venereal disease affected about one in five fighting men, so urgent action was needed. A licence was issued to Burroughs Wellcome to make and sell Salvarsan, and another to Poulenc in Paris to make and sell it through their British agents, May and Baker.<sup>34</sup>

The success of Burroughs Wellcome in producing Salvarsan substitutes led to the manufacture of other synthetic substitutions including aspirin, benzamine, emetine, flavine and phenacetin.<sup>35</sup> With the war extending into malarial areas supplies of quinine became crucial; during 1916 alone over 21 tons (nearly 65 million doses) were issued. The Official War Record noted that ‘the number of tablets of compressed drugs issued during the war amounted to 1,080 million, in addition to a very large number of tubes of hypodermic and ophthalmic tablets.’<sup>36</sup>

Boots expanded its fine chemical manufacturing activities; aspirin, phenacetin and atropine were produced in large quantities for government, home and overseas buyers. In 1917 they produced alternatives to Bayer’s *Adalin* and Casella’s *Flavine*. They made *Burnol* acriflavine cream under contract with the war-time British Fire Prevention Committee, and launched their own Chloramine-T disinfectant and Halazone water-sterilising tablets for supply to the forces.<sup>37</sup>

Smaller drug companies also flourished during the war. A.H. Cox & Co. had supplied the Government with pills and tablets during the Boer War, and were awarded further contracts in the First World War. In 1916 £6,000 of drugs were supplied under government contracts, and in 1917 drugs valued at £35,000 were compressed for the Government at a ‘nominal charge’. Nevertheless the turnover of the company more than doubled between 1915 and 1918, from £49,371 to £100,135.<sup>38</sup>

Drug companies had to make sacrifices of their own during the war. Some Allen and Hanburys branches suffered staff shortages as men enlisted in the forces; women worked for the first time on production lines. On 18 May 1918 a German bomb wrecked part of Allen and Hanburys Bethnal Green

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<sup>33</sup> M. Robson, ‘The British Pharmaceutical Industry and the First World War’, in J. Liebenau, (ed.), *The Challenge of New Technology: Innovation in British Business Since 1850* (Aldershot, Gower, 1988), p. 83-105.

<sup>34</sup> J. A. Slinn, *A History of May & Baker 1834-1984*. (Cambridge, Hobsons Limited, 1984), p. 92.

<sup>35</sup> R. Church, E.M. Tansey, *Burroughs Wellcome & Co: Knowledge, Trust, Profit and the Transformation of the British Pharmaceutical Industry 1880-1940* (Lancaster, Crucible Books, 2007), p. 258.

<sup>36</sup> W.G. Macpherson, *History of the Great War Based on Official Documents: Medical Services, General History, Volume 1* (London, HMSO, 1921), p. 179.

<sup>37</sup> S. Chapman, *Jesse Boot of Boots the Chemists* (London, Hodder and Stoughton, 1974), p. 97.

<sup>38</sup> J.A. Slinn, *Pills and Pharmaceuticals: A.H. Cox & Co. Limited 1839-1989* (Barnstaple, Arthur H. Cox, 1989), p. 49.

factory.<sup>39</sup> War-time production targets sometimes meant that corners were cut and accidents occurred; in September 1915 three men working for May and Baker at their factory in Dagenham lost their lives through the bursting of a centrifugal machine.<sup>40</sup>

### *Supply challenges*

Pharmacists in their shops were kept informed about shortages and possible substitutes through the *Journal's* weekly *War Notes and News*; and the *Chemist & Druggist* published helpful formulas and methods of preparation for a wide range of innovative products that they could prepare in their dispensaries. Restrictions were placed on glycerin from April 1916, and Orders were applied to everything from sugar, bismuth and shellac to cocoa, oils and fats. The government appointed an Advisory Committee on Drug Supply which included members of the Pharmaceutical Society and civil servants. It monitored the situation and suggested ways of alleviating shortages, usually by finding new sources of supply or suggesting possible substitutes. Prices of many items rose sharply due to initial speculation, particularly affecting bromides, salicylates and potassium salts.<sup>41</sup> The commissioners for National Health Insurance reported a six-fold increase in the price of bromides during the war.<sup>42</sup>

The Pharmaceutical Society issued a *War Emergency Formulary* as an aid to conserving essential drugs, and the Pharmaceutical Press, the Society's publishing arm, published a booklet entitled *War Emergency Notes for Pharmacists*, recognizing the need for 'easily accessible, recent and authoritative information on all subjects affecting the practice of pharmacy under Departmental Orders etc.'. The original edition consisted of three impressions each of 5,000 copies, all of which sold out. A second edition was published in 1918.

With less than perfect timing the fifth edition of the *British Pharmacopoeia* appeared in October 1914, two months into the war. It had been 16 years in preparation. The publishers stated that they had 'been able to produce a *British Pharmacopoeia* suitable for the whole Empire'. It contained 43 new items not included in the 1898 edition, and excluded no fewer than 168 items that had been included in the earlier edition. To this were added long lists

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<sup>39</sup> E.C. Cripps, *Plough Court: The Story of a Notable Pharmacy 1715-1927* (London, Allen and Hanburys Limited, 1927), p. 119.

<sup>40</sup> J.A. Slinn, *A History of May and Baker 1834 to 1984* (Cambridge, Hobsons Ltd, 1984), p. 94.

<sup>41</sup> R. Church, E.M. Tansey, *Burroughs Wellcome & Co: Knowledge, Trust, Profit and the Transformation of the British Pharmaceutical Industry 1880-1940* (Lancaster, Crucible Books, 2007), p. 255.

<sup>42</sup> Anon, *The war and the supply of drugs: A memorandum on the special measures taken by the NHI Commissioners in relation to the supply of drugs and other medicinal stores during the war* (London, Parliamentary Papers, Cd. 183, 1919), paragraphs 2-3, p. 7.

of articles for which the name had changed, the composition had altered, or the strength had been amended.<sup>43</sup> It was to be effective from 31 December 1914.

### *The invention of the gas mask*

The first incident of gas poisoning during the war occurred near Ypres early in 1915. On 19 April a British attack was forced back choking and gasping, convinced they had been gassed. The Germans had been installing cylinders in the trenches; some had been damaged and were slowly leaking. On 22 April the wind was favourable to the Germans and they released the gas, which was chlorine. Finding a solution to the poison gas problem became a major priority. The task of developing an effective gas mask capable of saving thousands of British and Allied lives fell to a pharmacist, Lieutenant-Colonel Edward Frank Harrison, CMG, DSO, of the Royal Engineers.

Harrison entered pharmacy as an apprentice in North London aged 14. He later worked in the Pharmaceutical Society's Research Laboratory, and with the outbreak of war he enrolled in the Sportsman's Battalion of the Royal Fusiliers, a Pals' battalion. He completed his basic training, and was about to embark for France when a call went out from the War Office for chemists to be transferred to the Royal Engineers; he was immediately promoted to Corporal.

Harrison and his team developed a Large Box Respirator which contained sodium thiosulphate, sodium phenolate, hexamine, an alkali and animal charcoal. These were manufactured by Boots until 1917, and about 200,000 were distributed. The team then developed the Small Box Respirator, a close-fitting mask fitted with eye-pieces, a nose clip and mouthpiece. Granules were prepared from an alkaline permanganate mixture consisting of lime, caustic soda and permanganate. Vegetable charcoal was used in preference to animal charcoal. Production started in July 1916.

John Bell, Hills and Lucas & Co., a wholesale pharmacy manufacturing company, hired a large workforce of women to produce anti-gas respirators at their works on Tower Bridge Road in London. Every part had to be tested and examined for leaks and weaknesses. Manufacture reached 50,000 a day, and in all some 20 million respirators were distributed.

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<sup>43</sup> Anon, *British Pharmacopoeia* (London, The General Council of Medical Education and Registration of the United Kingdom, 1914), p. ix-xxvii.



**Lieutenant-Colonel Edward Frank Harrison CMG, DSO Royal Engineers**

Harrison ultimately worked himself to death, and died of pneumonia on 4 November 1918, although overwork and exposure to poisonous gases contributed to it; he insisted on trying out experimental gas-masks on himself. Harrison's wife received a letter of condolence from Winston Churchill, then Minister of Munitions: 'I beg you to accept my deep sympathy in the loss of your distinguished husband. Colonel Harrison carried out great work for the Country, and it is due in large measure to him that our troops have been given

effectual protection from the German poison-gases.’<sup>44</sup> Churchill also revealed that he was about to recommend Harrison for promotion to Brigadier-General in charge of all chemical warfare at the time of his death.



**Making gas masks 1917**

### *Conclusion*

William Glyn-Jones, who at the end of the war became the Pharmaceutical Society’s Secretary and Registrar, later recalled that ‘the outbreak of the Great War came as a shock for which pharmacy and pharmacists, like every other

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<sup>44</sup> W.S. Churchill, ‘Letter of Condolence to Mrs Harrison’, *Private Papers of Lieutenant Colonel E F Harrison CMG* (London, Imperial War Museum, 1918).



section of the community, were unprepared. Such a contingency had not been contemplated and no plans made to meet it'.<sup>45</sup> He noted that the Society's activities during the war were concerned with two things; the proper allocation of pharmacists and their assistants between the Country's need for them for service with 'the Colours', and the necessity of maintaining essential pharmaceutical services not only for the forces but also for the civil community; and the provision, conservation and distribution of supplies of materials needed for pharmaceutical purposes. Pharmacists were needed at home, although he reflected that pharmacy was not classified as an essential occupation during the war.

At the end of the war, the pharmacy community, like the rest of the country, was simply relieved it was all over. The *Journal* reflected the mood in its editorial of 16 November 1918; it read 'The End of the War: Sursum Corda (lift up your hearts)'.<sup>46</sup>

### **Acknowledgements**

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<sup>45</sup> W. Glyn-Jones, 'Ten Years of the Society's History 1913-1923', *Pharmaceutical Journal*, 113, 3187 (15 November 1924), 525-8.

<sup>46</sup> Anon, 'The End of the War', *Pharmaceutical Journal*, 101 (16 November 1918), 237.