'The rejection of tradition in favour of experience:' The publication of British pharmaceutical texts abroad 1670 to 1890

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Abstract

This paper presents an analysis of Cowen's study of the popularity of translations and re-printings of British pharmaceutical texts abroad. Around 260 translations and reprints of over 30 publications were published between 1677 and 1871. The *London Pharmacopoeia* was the most frequently reproduced, although the largest category was the dispensatories, representing 52% of all those published. British texts were most popular in Germany, accounting for 41% of the total; along with the Netherlands, Italy, France and the United States it accounted for 90%. The appearance of translations fluctuated decade to decade, with geopolitical events having an important impact. Publications peaked between 1750 and 1800, accounting for 51% of all texts published abroad.

Introduction

During the eighteenth and nineteenth centuries British pharmaceutical texts achieved a popularity and influence that extended far beyond the shores of the British Isles, and greatly exceeded the impact of those of any other nation. Yet we know surprisingly little about the origins of this phenomenon, the reasons for it, and how it was sustained over such a long period. But such texts played an important part in spreading pharmaceutical knowledge across Europe, America and elsewhere. Whilst the popularity and influence of British texts abroad has received little attention from historians, one notable exception is the work of the American pharmaceutical historian David Cowen. In 2001 he published the results of his historical and bibliographic study of the spread and influence of British pharmacopoeial and related literature; it appears in section VII of his book 'Pharmacopoeias and Related Literature in Britain and America, 1618 to 1847.'[1]

In text and tables Cowen demonstrates the diversity of pharmaceutical texts published abroad, the range of countries where such publication took place, and the long time period over which this occurred. The picture presented is one of widespread influence in many places over many years. But to what extent were such publications more popular in some countries than in others? Was publication of texts steady over many decades, or did it proceed in fits and starts? Was publication equally spread between different texts, or were some much more popular than others? And what was the time lag between publication in Britain and publication abroad? Cowen leaves readers to find the answers to these questions themselves; they are the questions addressed in this paper.

The publication of pharmaceutical texts in Britain

Pharmaceutical literature takes a great many forms; by the start of the seventeenth century there was already a wide range of printed materials available relating to medicines and how to prepare them. Some were based on the work of classical scholars such as Galen and Avicenna; others were the work of more recent practitioners. The introduction of movable type and the printing press in Europe by Gutenberg in 1439 greatly facilitated the transmission of pharmaceutical knowledge. Publication of the *Recettario fiorentino* in Florence in 1498[2] led to state-sponsored formularies or pharmacopoeias appearing in many countries over the following decades. Between 1600 and 1700 over 25 separate pharmacopoeias were published, mainly in Europe.[3]

In the sixteenth and seventeenth centuries pharmaceutical knowledge became increasingly codified with the development of a number of distinct forms. In addition to official publications supplementary texts appeared that expanded this knowledge; these often included details such as how to collect medicinal plants, how to prepare medicines for administration, and the conditions for which medicines were recommended. There were also volumes assembled by prominent physicians or medical societies, mostly written in Latin. In his study Cowen identified five main categories of British pharmaceutical texts that were printed abroad, and these provide a useful basis for analysis.[4] They include texts published mainly for professional use in dispensing and prescribing, but exclude texts on therapeutics aimed specifically at physicians and works on domestic medicine.

Pharmacopoeias and conspectuses

Of the various categories of pharmaceutical literature the most important were the official pharmacopoeias. Cowen defined a pharmacopoeia as 'a compendium of drugs and formulas which is intended to secure uniformity and standardisation of remedies, and which is made legally obligatory for a particular political jurisdiction, especially upon the pharmacists and pharmaceutical manufacturers of that jurisdiction'.[5] He also noted that it 'must be prepared by an official pharmacopoeia commission', one that has the authority of a monarch, state or parliament. Pharmacopoeias usually

Table 1: *Editions or revisions of Pharmacopoeias published in Britain 1618 to 1948*

London Pharmacopoeia	**Edinburgh Pharmacopoeia**	**Dublin Pharmacopoeia**	**British Pharmacopoeia**
1618 (first edition)	1699 (first edition)	1793 (first specimen)	1864 (first edition)
1621 (reprint)	1722 (second edition)	1805 (second specimen)	1867 (second edition)
1632 (reprint)	1735 (third edition)	1807 (first edition)	1885 (third edition)
1639 (reprint)	1744 (fourth edition)	1826 (second edition)	1885 (Indian edition)
1650 (second edition)	1756 (fifth edition)	1850 (third edition)	1898 (fourth edition)
1677 (third edition)	1774 (sixth edition)	1856 (reprint)	1900 (Indian and Colonial Addendum)
1721 (fourth edition)	1783 (seventh edition)		1901 (Government of India Addendum)
1746 (fifth edition)	1792 (eighth edition)		1914 (fifth edition)
1788 (sixth edition)	1803 (ninth edition)		1932 (sixth edition)
1809 (seventh edition)	1805 (reprint)		1948 (seventh edition)
1815 (altered edition)	1817 (tenth edition)		
1824 (eighth edition)	1839 (eleventh edition)		
1836 (ninth edition)	1841 (twelve edition)		
1851 (tenth edition)			

contained catalogues of simples, or single medicines, along with a collection of prescriptions and directions, established under the authority of the state as a means of setting standards and encouraging greater consistency in treatment, prescription and dosage. Many of the early pharmacopoeias were published by city states, and the extent of their jurisdiction was usually limited. In Britain between the early seventeenth and mid-nineteenth centuries three separate pharmacopoeias were published; the *London Pharmacopoeia*, the *Edinburgh Pharmacopoeia* and the *Dublin Pharmacopoeia,* each produced by the relevant College of Physicians. They were all subsequently replaced by the *British Pharmacopoeia,* which was published for this specific purpose[6] (Table 1).

Following publication of the first edition of the *London Pharmacopoeia* in 1618 two further editions were produced in the seventeenth century, although periodic reprints appeared.[7] A further three editions appeared during the eighteenth century. With the fourth edition, published in 1721 under the direction of Sir Hans Sloane (1660-1753), a serious effort was made to delete many obsolete and irrational remedies, and to replace them with new chemical preparations.[8] The preface claimed that 'all remedies owing their use to superstition and false philosophy' had been thrown out. Indeed, Wootton claims that the transition from the 'old' to the 'new' pharmacy can be traced to this volume.[9] The botanical names of plants were included for the first time.

Further attempts at modernisation were made in the fifth edition, published in 1746. By the sixth edition, in 1788, the College claimed to have paid particular attention to 'the applications of the advances of chemistry to pharmacy'. The seventh edition, in 1809, introduced the new chemical nomenclature; nearly 100 items were deleted and a similar number added. Rationalisation continued with the eighth edition, although morphine, iodine and quinine were omitted, despite their use being widely established in medical practice.[10] Richard Phillips, a pharmacist, subsequently undertook the revisions resulting in the ninth edition.[11] This included many new products as well as methods for determining the purity of medicines and for preparing chemicals.

The first edition of the *Edinburgh Pharmacopoeia* appeared in 1699, 80 years after the London one. Unlike their London counterparts, the Royal College of Physicians of Edinburgh attempted, with considerable success, to issue revised editions every 10 to 12 years. Seven further editions appeared during the eighteenth century.[12] With the 1774 edition many changes were made to bring the publication up to date; as in London, reform was led by a leading figure amongst the physicians; Sir John Pringle (1707-1782) insisted that most of the obsolete *materia medica* be deleted.[13] Four editions were published during the first half of the

nineteenth century, the ninth in 1803 and the last in 1841.[14]

The *Dublin Pharmacopoeia* had a much shorter existence. A first specimen edition was distributed only to members of the Dublin College of Physicians. A second College edition followed before a first public edition appeared in 1807. Second and third editions followed, with the final reprint of the third edition appearing in 1856.[15] Issues of national identity appear to have played a part in the publication of both the Edinburgh and Dublin pharmacopoeias; the first edition of the *Edinburgh Pharmacopoeia* preceded the 1707 Acts of Union between Scotland and England by eight years; the first specimen edition of the *Dublin Pharmacopoeia* preceded the Acts of Union (uniting the Kingdoms of Great Britain and Ireland in 1801) by the same period.[16]

As increasing numbers of pharmacopoeias appeared, collections of what were judged to be the most useful parts of each were assembled in volumes called conspectuses. These were mainly a feature of the early nineteenth century. They were usually used abroad as the basis of a broader consolidation of pharmacopoeias. One of the earliest was published by Robert Graves (1763-1849) under the title *A Pocket Conspectus of the London and Edinburgh Pharmacopoeias* in 1797.[17]

Dispensatories, hospital and military formularies

The appearance of pharmacopoeias prompted the publication of a range of supplementary texts. Individuals developed and published guides to the collection and making of medicines; these were usually known as dispensatories, although some bore the name pharmacopoeia. They were largely a British speciality and were essentially pharmacists' handbooks. The *Edinburgh Dispensatory* began life in 1753 when William Lewis (c.1708-1781) compiled his *New Dispensatory*.[18] Five further editions followed, the last appearing in 1799. All editions contained the elements of pharmacy and pharmaceutical chemistry in Part 1, gave a detailed description of *materia medica* in Part 2 (including the medical indications for use of each drug) and compositions in various dosage forms with formulas and directions in Part 3.

The *New Dispensatory* was followed by the *Edinburgh New Dispensatory,* the first edition of which was published in Edinburgh in 1786. The second and third editions were edited by Andrew Duncan the elder (1744-1828), and the fourth, fifth and sixth by John Rotheram (c. 1750-1804). The last of this series appeared in 1801, although it was re-issued in 1818. A third series, also called the *Edinburgh New Dispensatory,* first appeared in 1803. All editions were edited by Andrew Duncan the younger (1773-1832), the twelfth and last being published in 1830. The success of the Edinburgh Dispensatory spawned many others; British physicians who took to compiling dispensatories, many of which were published abroad, included Thomas Fuller (1654-1734), James Shipton (c.1630-1700) and Jonathan Goddard (1617-1675).

Beyond the pharmacopoeias, the dispensatories and the conspectuses, more specialist needs resulted in a range of other publications. These included a range of hospital and paupers' formularies and pharmacopoeias, and military and surgical handbooks. However, the only British hospital formulary known to have been published abroad was that of the Royal Infirmary of Edinburgh, highlighting the reputation of Edinburgh physicians and medical training during this period. Military and surgical pharmacopoeias fulfilled a particular need, and several British works on military and surgical pharmacy were published abroad.[19]

The movement of British pharmaceutical texts abroad

Pharmaceutical knowledge travelled across geographical and national boundaries through a variety of mechanisms that all involved the movement of either goods or people. Huge numbers of Britons travelled overseas to make their fortunes or start new lives. In the seventeenth century over 250,000 people emigrated from Britain to North America alone. Immigrants included a number of physicians and apothecaries, who carried with them the publications needed to practice their profession. Other publications found their way abroad through the normal channels of trade, such as importing by wholesalers. Copies exchanged hands through scientific interaction; and overseas practitioners obtained copies for their own use. In due course many were reprinted or reproduced, with many being used as sources of information by those tasked with developing similar compilations in their own countries.

Once received in another country British pharmaceutical texts were used in a variety of ways. They could be used as received, as an important reference source of useful information. This was accessible to those familiar with Latin, or English where English translations were available; they would also be reprinted or reproduced locally. But in many countries there was inevitably a demand for translations into the local language. This could be done on a word for word basis, but more often the temptation of local translators was to carry out extensive edits, with new material added along with local preferences and prejudices. British pharmaceutical literature thus often formed the basis of other countries' conspectuses and dispensatories, with selections being made from a range of foreign pharmacopoeias and formularies.

British pharmaceutical texts translated or reprinted abroad

Outside the English-speaking world there was the a substantial demand for translations of British pharmaceutical texts. British pharmacopoeias were translated into Dutch, German, French, Spanish, Hindustani and Malagasy, as well as English and possibly other languages. They were printed in 25 cities in 10 countries, from Boston in the United States to Antananarivo in Madagascar. The earliest known translation of the *London Pharmacopoeia* was the *Pharmacopoeia Collegii Regali Londini* published in Leyden in the Low Countries (Holland and Belgium) in 1677. A second publication, attributed to James Shipton, appeared in 1681 following publication of a third edition of the *London Pharmacopoeia* in 1677. A translation into Dutch was issued in Amsterdam in 1696. Cowen notes that, by the time the first *Edinburgh Pharmacopoeia* was reproduced on the continent in Gottingen in 1742, at least six issues of the *London Pharmacopoeia* in Latin, English and Dutch had already appeared outside Britain.[20]

Foreign issues of British pharmacopoeias that have been reported in the literature include 47 of the *London Pharmacopoeia,* 27 of the *Edinburgh Pharmacopoeia* and one of the *British Pharmacopoeia* 1864. The *Dublin Pharmacopoeia* was not reproduced abroad except as part of other publications.[21] The number of editions of British pharmacopoeias published abroad, along with the years of their first and last appearance, are summarised in Table 2. Together they account for 94, or 36% of all British pharmaceutical texts published abroad.

Table 2: *British pharmacopoeias, conspectuses and hospital and surgical compendia published abroad 1677 to 1871*

British text from which edited or translated version produced	Year first published abroad	Year last published abroad	Years between first and last publications	Number of editions published
Pharmacopoeias:				
London Pharmacopoeia	1677	1851	174 years	54
Edinburgh Pharmacopoeia	1742	1847	105 years	32
Dublin Pharmacopoeia	1816	1851	35 years	5 (in Codexes)
British Pharmacopoeia	1868	1885	14 years	3
			Total:	**94**
Conspectuses:				
Graves' Pocket Conspectus	1798	1803	5 years	2
French Conspectus of British Pharmacopoeias	1820	1820	0 years	1
Thomson's Conspectus	1825	1862	37 years	9
Prescriber's Pharmacopoeia	1842	1853	11 years	3
Foote's Practitioner's Pharmacopoeia	1855	1855	0 years	1
			Total:	**16**
Hospital and pauper compendia:				
Edinburgh Hospital Pharmacopoeia	1750	1763	13 years	6
Pharmacopoeia for the Poor (attributed to a Dr W)	1757	1776	19 years	2
			Total:	**8**
Surgical and military compendia:				
Theobald's Medulla Medicinae Universae	1750	1753	3 years	2
Dossie's Theory and Practice of Surgical Pharmacy	1771	1771	0 years	1
Pharmacopoeia Chirurgica	1797	1815	18 years	2
Wilson's Pharmacopoeia Chirurgica	1818	1818	0 years	1
New Medico-chirurgical Pharmacopoeia	1824	1824	0 years	1
			Total:	**7**
Total for above categories				**125**

The conspectuses, hospital and pauper compendia and surgical and military compendia generally had less impact than the pharmacopoeias and dispensatories. However, Thompson's *Conspectus of the Pharmacopoeias of the London, Edinburgh and Dublin Colleges of Physicians,* published in 1820, went through seven American editions between 1825 and 1862. Later ones included American material, which necessitated addition to the title of the words 'and of the *United States Pharmacopeia*'. In Germany, A. Braune added the word 'Zusätze' to his edition of Thompson's work published in 1827.[22] Other works in this category included an anonymous *Prescriber's Pharmacopoeia*, and John Foote's *Practitioner's Pharmacopoeia,* which was reproduced in the United States four times between 1842 and 1855.[23]

A version of Robert Graves's *A Pocket Conspectus of the London and Edinburgh Pharmacopoeias* was published in Vienna in 1798, under the title *Dispensatorium Universale,* and a faithful reprint appeared in Philadelphia in 1803. In Paris a *Conspectus des pharmacopées de Dublin, d'Edinburg, de Londres et de Paris* was published in 1820, which included an appendix with material taken from seven other pharmacopoeias.[24] Anthony Thompson published his *Conspectus of the Pharmacopoeias of the London, Edinburgh and Dublin Colleges of Physicians* in 1820.

Cowen reports finding five overseas editions of the hospital formulary published by the Royal Infirmary of Edinburgh, including two at Frankfurt (in 1760 and 1762) and one at Geneva (in 1763). A *Pharmacopoeia for the Poor* was published in Paris in 1757 and again in 1776; it was claimed to be a translation of a publication by a Dr W. of London, although the original has not been traced.[25]

Of the military and surgical texts, Dossie's *Theory and Practice of Surgical Pharmacy* was published in French in Paris in 1771. A Spanish version of James Wilson's *Pharmacopoeia Chuirurgica,* originally written in English, was published in 1797 and again in 1815; this work was reprinted in Philadelphia in 1818. John Theobald's military compendium, *Medulla Medicinae Universae*, compiled on the orders of the Duke of Cumberland for use at military hospitals abroad, was translated into Italian in 1750 and French in 1753. The anonymous English *New Medico-chirurgical Pharmacopoeia* was translated into German, with a note to the effect that the formulas listed were for handling surgical sicknesses.[26]

Table 3: *British dispensatories published abroad 1686 to 1848*

British text from which edited or translated version produced	**Year first published abroad**	**Year last published abroad**	**Years between first and last publications**	**Number of editions published**
Dispensatories:				
Staphorst's Officina chymica Londinensis	1686	1701	15 years	2
Pharmacopoeia Bateana	1688	1791	103 years	12
Pharmacopoeia Bateana cum Goddard	1702	1776	74 years	14
Lower's Receipts	1702	1762	60 years	8
Fuller's Pharmacopoeia extemporanea	1709	1804	95 years	22
Pharmacopoeia Radcliffeana	1720	1753	33 years	5
Quincy's Pharmacopoeia officinalis et extemporanea	1749	1785	36 years	3
Fuller's Pharmacopoeia Domestica	1750	1753	3 years	3
James's Pharmacopoeia Universalis	1758	1758	0 years	1
Pharmacopoeia Meadiana	1761	1785	24 years	5
Brookes General Dispensatory	1765	1773	8 years	6
Lewis's New Dispensatory	1768	1815	47 years	21
Edinburgh New Dispensatory (Duncan Sr)	1791	1798	7 years	2
Munro's Treatise and Translation of the London Pharmacopoeia	1791	1797	6 years	6
Pearson's Thesaurus Medicaminum	1793	1800	7 years	2
Edinburgh New Dispensatory (Rotheram)	1796	1797	1 year	5
Edinburgh New Dispensatory (Duncan Jr)	1805	1850	45 years	17
Christison's Dispensatory	1848	1848	0 years	1
			Total:	**135**

Authorship of British pharmaceutical texts published abroad

A wide range of individuals was involved in producing or translating British pharmaceutical texts. The largest single group of texts published abroad was the dispensatories, although not always under that title. Table 3 summarises the number of editions published, with the years of their first and last appearance. Together they account for 135, or 52% of all such texts published abroad. Shipton's *Pharmacopoeia Bateana* was published in Amsterdam in 1688. During the eighteenth century 26 versions were published in 10 cities, in Holland, Belgium, Switzerland, Italy, France, Spain and Portugal. It mainly appeared in Latin, although Dutch and Portuguese translations are known. An overseas version of the dispensatory of Jonathan Goddard was published in Frankfurt in 1702, under the title *Arcana Goddardiana;* this was the first of at least 13 versions.

Thomas Fuller's *Pharmacopoeia Extemporanea* appeared on the continent soon after Bate's, in 1709. Many versions of the *Pharmacopoeia Bateana* included an appendix written by Fuller; around 21 versions were published during the eighteenth century. When it last appeared, in 1804, it had been published in eight cities in Holland, Belgium, France, Switzerland and Italy. Fuller's later volume, the *Pharmacopoeia Domestica*, appeared around 1750 in Leyden, and possibly also in Basel and Louvain. The pharmaceutical texts that spread around Europe during this period were thus largely the work of four Britons; Bate, Shipton, Goddard and Fuller.

But several other dispensatories by lesser known authors also became popular. These included works by Nicholas Staphorst, Richard Lower, John Radcliffe and Robert James. They variously appeared in Latin, German, French, Italian or Portuguese. Cowen found 31 references to such authors, the first in 1686, the last in 1800.[27] The most popular of the dispensatories was the *Edinburgh New Dispensatory;* between 1768 and 1850 six American and 18 European versions were published. It was considered to be the 'most esteemed' of British pharmaceutical literature, with versions appearing in German, French, Dutch, Italian and Portuguese. They were large publications; the French edition of 1775 appeared in three volumes.

Whilst most of the translations were carried out by local physicians or pharmacists, some were undertaken by British physicians who had emigrated to the country concerned. In Russia, Sir Alexander Crichton (1763-1856), an Edinburgh trained physician, was the co-author of the *Pharmacopoeia in usum nosocomii pauperum Petropolitani,* published at St Petersburg in 1807.[28] In Prussia, Sir James Wylie (1768-1854), a physician from Aberdeen, acknowledged the influence of the London and Edinburgh pharmacopoeias, as well as the Prussian pharmacopoeia, in the compilation of his *Pharmacopoeia Castrensis Ruthena,* published in 1808.[29] Some years later, in 1862, Andrew Davidson went out to Madagascar to be physician to King Radama II. In 1871 he presented a version of the *British Pharmacopoeia* in the Malagasy language, the *British Faramakopia*. Its stated aim was to disseminate pharmaceutical knowledge amongst local practitioners.[30]

The rise and fall of British pharmaceutical texts published in Europe

Year by year examination of Cowen's tables[31] enables an assessment to be made of the extent and rate of uptake of British pharmaceutical texts in each country. The quarter century of publication of the 260 volumes identified by Cowen is indicated in Table 4. This indicates a steady rise in publications up to the mid eighteenth century, and a steady decline thereafter. But a quarterly analysis disguises large year to year variations and extended periods when no British pharmaceutical texts at all were published abroad. This sudden rise and fall in their popularity can be at least partly explained by geopolitical events; for much of the period European nations were at war with either Britain or each other.

It was almost 60 years after its first appearance in Britain that the Dutch translation of the *London Pharmacopoeia* was published 1677. Its second edition had been published in 1650, and its third in 1677. The Dutch appear to have been in no hurry to make use of the London publication. Part of the explanation may be that until 1674 England and the Netherlands were regularly at war.[32] Dutch translations of British texts rose steadily following the assumption of the British crown by the Dutch William of Orange and his wife Mary in 1688. The production of such translations peaked in the 1770s, with seventeen appearing between 1751 and 1775. They then declined, at a time when they were still rising in Germany, Italy and elsewhere. Geopolitical events may again provide some explanation for this sudden loss of popularity of British texts. The Fourth Anglo-Dutch War broke out in 1780, and continued until 1784. Britain was clearly out of favour in the Low Countries, although seven pharmaceutical texts were published there between 1776 and 1800 nevertheless.

France, Britain's closest neighbour, initially showed little interest in British pharmaceutical texts; the earliest British text published there was the *Pharmacopoeia Bateana* in 1704, 27 years after adoption of the first British text in the Netherlands, and some

Table 4: *British pharmaceutical texts published abroad by country and by quarter century 1676 to 1900*

Country	1676-1700	1701-1725	1726-1750	1751-1775	1776-1800	1801-1825	1826-1850	1851-1875	1876-1900	Total
Germany	1	17	9	25	32	16	5	2		107
Netherlands	5	8	8	17	7	1				46
Italy		2	3	9	10	4	4			32
France		2	1	12	4	3	5			27
Switzerland	1		3	4						8
Portugal		1		2	1	3				7
Spain				1	2	1				4
USA		1			4	5	7	5		22
Austria					2					2
India						1	2		1	4
Madagascar								1		1
Total:	7	31	24	70	62	34	23	8	1	260

years after Germany (1686), Switzerland (1693) and Italy (1703). France had a tradition of producing its own pharmaceutical literature, such as the works of Charas, Lémery, Pomet and Manget;[33] and England and France were almost continuously at war, from the Hundred Years War to the Anglo-French War between 1627 and 1629. Relations between the countries remained troubled throughout the seventeenth century and for much of the eighteenth century. But the Seven Years' War, starting in 1754, soon engulfed most of Europe. At its end Britain was soon at war with France again. An Anglo-French War took place between 1778 and 1783, and in 1779 Britain was also at war with Spain. The French Revolution in 1789 caused further disruption. Any peace in Europe was broken by the start of the Napoleonic Wars in 1799, continuing until 1815.

But wars and blockades rarely put a stop to the translation and publication of British pharmaceutical texts aboard. Editions of the *London Pharmacopoeia* appeared in France in 1761, 1762, 1764 and again in 1788, throughout both the Seven Years' War and the Anglo-French War. The Napoleonic Wars brought things to a temporary halt; but the *London Pharmacopoeia* of 1809 was translated into French by Chaussier, and it appeared in Paris as *La Pharmacopée du Collège de Médecine de Londres* in 1812 on the very eve of Napoleon's defeat in Europe.[34] Further French editions appeared in 1837 and 1840. In Paris the American physician William Tazewell included a pharmacopoeia in the second part of his *Vade Mecum Medicum.* He acknowledged that this was developed from his notes as a student at Edinburgh, and from other sources including the *London Pharmacopoeia.*

The period between 1776 and 1800 saw the rapid uptake of British pharmaceutical texts by Germany. Pre-French Revolution publications appearing in Germany showed a strong preference for dispensatories and hospital and military compendia. An edition of Quincy's *Pharmacopoeia Officinalis* appeared in 1749, a Theobald's *Medulla Medicinae* in 1753, a *Pharmacopoeia for the Poor* in 1757 and a Fuller's *Pharmacopoeia Extemporanea* in 1785. There is a noticeable preference by Germany for British rather than French texts after the Napoleonic Wars, although a German translation of a *French Conspectus of British Pharmacopoeias* appeared in 1820. Post-revolution publications in Germany included Lewis's *New Dispensatory* in 1803, and an *Edinburgh Dispensatory* edited by Andrew Duncan junior in 1826.

In Italy 32 editions of British pharmaceutical texts were published over 150 years. The first (a *Pharmacopoeia Bateana cum Goddard*) was published in 1703, the last (an *Edinburgh Dispensatory*) in 1850. But in other European countries the influence of British texts was more limited. Although one of the first countries to do so Switzerland published only eight British texts between 1683 (a *Pharmacopoeia Bateana*) and 1766 (an *Edinburgh Pharmacopoeia*). Portugal published seven editions, from a *Pharmacopoeia Bateana* in 1713 to several versions of Lewis's *New Dispensatory* in 1815. Spain published just three editions, a version of the *London Pharmacopoeia* in 1797 and editions of the *Pharmacopoeia Chirurgica* in 1797 and again in 1815. Finally, Austria published two British pharmaceutical texts; a version of the *Edinburgh Pharmacopoeia* appeared in 1778, and one of Graves's *Pocket Conspectus* appeared in 1798.

The influence of British pharmaceutical texts beyond Europe

British pharmaceutical texts found their way not only to Europe but to all those places where Britain established colonies or acquired territories as part of its growing empire; these included America and India. Before they developed their own, medical and pharmaceutical practitioners in America relied heavily on the European books they took with them. Most American-born physicians trained at either Edinburgh or London and returned with the latest British pharmaceutical literature. This usually included the Edinburgh and London dispensatories and pharmacopoeias, although the *Parisian Pharmacopoeia* was sometimes included. Practitioners from other countries used the literature of their own country, although English pharmaceutical texts remained dominant.[35]

An edition of the *London Pharmacopoeia* was published in America in 1720, but enthusiasm for reprinting British texts was interrupted by the American War of Independence (the American Revolutionary War) between 1775 and 1783. However, the influence of such texts on American practice actually increased after the war. Various editions of the *Edinburgh Dispensatory* were published in 1791, 1796, 1798 and 1805; and a faithful reprint of Robert Graves' *A Pocket Conspectus of the London and Edinburgh Pharmacopoeias* appeared in Philadelphia in 1803.

The influence of both the London and Edinburgh pharmacopoeias is apparent in the compilation of the first *Pharmacopoeia of the United States of America.*[36] Preparation began in 1817 and it was published in 1820 in Boston.[37] An American edition of Wilson's *Pharmacopoeia Chirurgica* appeared in 1818 along with a new edition of the *Edinburgh Dispensatory*, and one of Thomson's *Conspectus* was published in 1825. A further 12 British pharmaceutical texts were printed in the United States between 1842 and 1862, the last two being revised editions of Thomson's *Conspectus.* None appeared after the end of the American Civil War in 1865.

British pharmaceutical texts including the London and Edinburgh pharmacopoeias were also taken to India by those who went there to serve the nation or set up businesses in the early nineteenth century. But the need for texts that met the particular needs of practitioners in India was soon recognised, and the result was the publication of a *Bengal Dispensatory* in 1841 and of a *Bengal Pharmacopoeia* in 1844; these were strongly influenced by the *Edinburgh New Dispensatory* and the *Edinburgh Pharmacopoeia*.[38] Following the Indian Mutiny of 1857 (India's First War of Independence) and the start of the British Raj, British-produced texts came to dominate, particularly with publication of the first edition of the *British Pharmacopoeia* in 1864.[39] Its sphere of influence slowly widened with each successive edition. In 1885 the locally produced *Pharmacopoeia of India* of 1868 was suppressed and the *British Pharmacopoeia* was made the 'sole authority on all matters pertaining to pharmacy in India, and remained an important influence on Indian pharmaceutical literature thereafter'.[40] But British texts did not have a monopoly on useful information in India; American texts also found a use.[41]

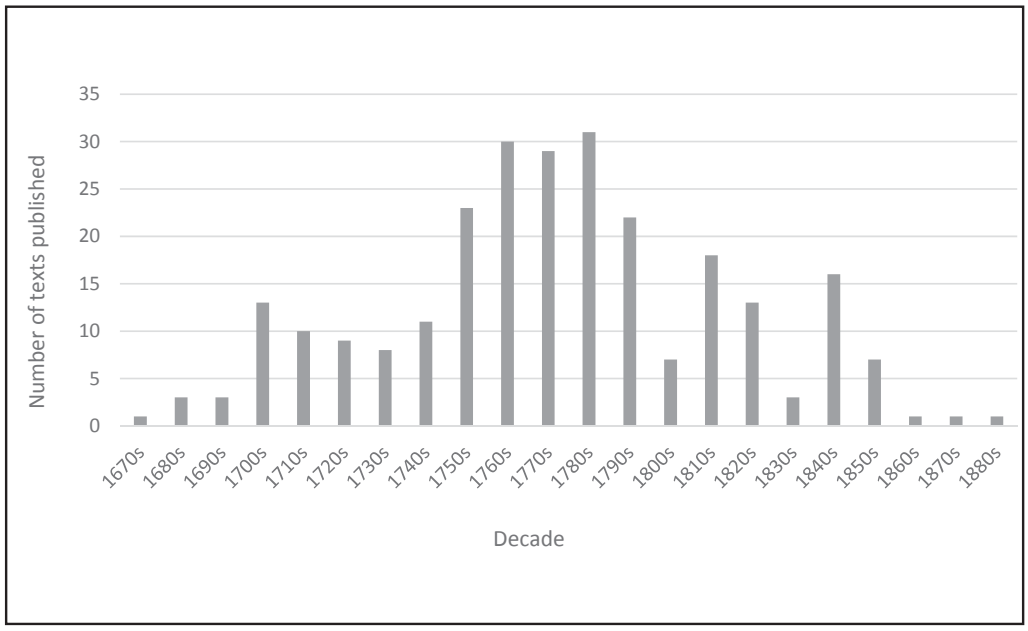

Figure 1: *Number of British pharmaceutical texts published abroad by decade 1670s to 1880s*

An overview of the rise and fall in the popularity of British pharmaceutical texts can be obtained by collating the number of texts published abroad during each decade (Figure 1). This shows an initially small rise in the number of publications in the 1700s, which dips slightly during the 1720s and 1730s, before rising to a peak of 31 publications during the 1780s. There is then a gradual decline towards the 1830s, with another short-lived jump to 16 in the 1840s. Thereafter the number of publications declines rapidly to only one in the 1880s. This analysis indicates that a total of 130 publications, or 50% of the total, appeared during the 50 year period between 1750 and 1799. By the start of the nineteenth century interest in British pharmaceutical texts had dropped considerably, and by the time the first *British Pharmacopoeia* was published in 1864 it had virtually ended.

The reception of British pharmaceutical texts abroad

Sources shedding light on how British pharmaceutical texts and translations of them were received abroad include the introductory comments made by translators and editors and contemporary book reviews. From these it is possible to discern the main factors accounting for the ready acceptance of British pharmaceutical texts abroad, the enthusiasm with which they were received, and the influence they had on local practice. Cowen identified three such factors: it took place within the normal processes of cultural diffusion; the intrinsic quality of the British product was such that people valued its contents; and there was a clear need that was not adequately met locally.[42]

Not surprisingly, editors and translators preparing their own editions and translations tended to see particular merit in the British works they selected, and this was often readily recognised by those who reviewed the new volumes. British works were widely acknowledged for 'their enlightened approach'; 'their great discernment'; and 'their rejection of tradition in favour of experience'.[43] The simplicity and brevity of British works were also much praised. They were also extolled for their layout and 'neat arrangement'. Conspectuses, combining material from several pharmacopoeias, were considered especially useful. The fact that the works were 'the result of efforts of distinguished physicians and collective efforts of Colleges' added to their prestige.

The process of translation was usually accompanied by varying degrees of editing, correcting and augmentation. Sometimes it was claimed that the translation resulted in a vast improvement to the original. Some critics even contended that the only merit of the British works came from the local editors. The French version of the *London Pharmacopoeia* published in Paris in 1761, and again in 1771, had, according to one critic at the time, merely used the *London Pharmacopoeia* as a rough draft. It was criticised as being simply a handbook 'without theory and without principle' on the basis of which the French translator had succeeded in creating an outstanding work.[44] Even when pharmacopoeias were adopted largely unchanged the local commentary was sometimes highly critical. A later Paris printing of the *London Pharmacopoeia in* 1785 was criticised for being little different to that of an edition that had appeared in 1766.[45]

The most serious criticisms came from Germany, although this was largely limited to the *London Pharmacopoeia,* particularly that of 1788.[46] An anonymous work published in Hamburg in 1790 was picked up by many learned journals. It contended that the *London Pharmacopoeia* did not merit the great praise that had been heaped upon it, a view echoed by *Chemische Annalen,* which claimed to have held such an opinion for some time.[47] Amongst the deficiencies found were that some descriptions were too short, nomenclature had been changed, efficacy, strength and dosage were missing and many important preparations had been omitted.[48] But such criticisms were the exception rather than the rule; the overwhelming majority of reviews indicated that British pharmaceutical texts were very favourably received on the continent.[49]

The compilers of the first American pharmacopoeia in 1820 also were not uncritical of the British texts. The preface to this volume notes that 'the fault of the lists of the *materia medica* which have been adopted in different countries has always been their redundancy rather than their deficiency. The number of articles necessary for the management of diseases ... is always very far short of the catalogue afforded by most pharmacopoeias.' As a consequence 'many articles contained in European books have been omitted in the *American Pharmacopoeia*.'[50]

The continuing popularity of British pharmaceutical texts abroad

Whilst some translations and reprints abroad survived only a single edition, many others went through numerous editions and some continued to be published for over a 100 years. It is also evident that some continued in use for many years after the last edition appeared. Clearly it was highly profitable to reproduce such literature abroad, since it would not have continued for as long as it did otherwise. The investment in time and effort involved in translating British pharmaceutical texts was repaid many times. Profitability was a consequence of both recognition and acceptance, and it was the key to explaining the continuing popularity of British texts abroad.

It was the willingness of the British compilers of pharmaceutical texts to tackle irrationality and to embrace new discoveries that set them apart from their counterparts elsewhere. Indeed, by the late eighteenth century the pharmacopoeias were said by some to have been developed in Britain with 'a reforming zeal'[51] that eliminated 'superfluities',[52] and the compilers were praised for having the courage to erase 'even the name of Theriac'.[53] But others were alarmed at the excessive number of eliminations. Time and again, noted Cowen, the continental editors added long lists of drugs that had been omitted from the British publications. The French pharmacist C.O. Cadet, reflecting on the tenth edition of the *London Pharmacopoeia* published in 1809, wrote in 1812 that 'perhaps the reforming zeal of the English doctors has gone a little far'.[54] Nevertheless, new medical knowledge and new medicines were incorporated into the translations and reprints, the new chemistry was taken into account and the new nomenclature of Linnaeus was introduced.

Cowen concluded that the popularity of British pharmacopoeial literature abroad reflected Britain's reputation for clear leadership in pharmacopoeial reform over many years, dating from compilation of the first edition of the *London Pharmacopoeia* by the Royal College of Physicians early in the seventeenth century.[55] Later key figures in British pharmacopoeial reform, including Sir Hans Sloane and Sir John Pringle, accelerated this approach by deleting many irrational items from subsequent editions and adding new items based on contemporary practice. But many others were also involved in pressing for reform, including Lewis in developing his *New Dispensatory* and the others who developed their own compilations.

The decline in popularity of British pharmaceutical texts abroad

The popularity of British pharmaceutical texts abroad slowly began to decline from the early nineteenth century. Several developments took place largely in parallel; in Britain the range of texts broadened in response to developments in science, especially the transformation of pharmaceutical chemistry in the early 1800s, leading to advances in the analysis, synthesis and testing of drugs. This facilitated a more scientific approach to *materia medica* that was reflected in new texts. In 1839 Jonathan Pereira, who was appointed professor of *materia medica* at the Pharmaceutical Society of Great Britain right after it was founded in 1841, published his *Elements of Materia Medica* in two volumes; this was claimed as the first great English work on *materia medica*, and in its time was stated to be without rival in any other language.[56]

Other development took place elsewhere. By the early nineteenth century many of the countries where British pharmaceutical texts were popular had produced texts of their own, including pharmacopoeias that increasingly applied nationally rather than at the city state or province level.[57] Thompson describes the origins and development of no fewer than 35 national pharmacopoeias.[58] In France, for example, the first *Codex Medicamentarius sive Pharmacopoea Gallica* was published in Latin in 1818, and was translated into French a year later. Editions of the Codex were published regularly, in 1837, 1866, 1884, with a supplement in 1895, and then at regular intervals during the twentieth century.[59] As they introduced and refined their own works, usually in their own language, countries became less dependent on works published elsewhere.

The second half of the century was a time of rapid growth of pharmaceutical knowledge, and new texts emerged to explain and interpret it. In 1859 Peter Squire published the first edition of his *Companion to the British Pharmacopoeia;* it ran to 19 editions, the last appearing in 1916. International collaborations became more frequent; one such resulted in the publication in 1874 of *Pharmacographia* by the German Friedrich Flückiger and the British Daniel Hanbury; this remained an authoritative text on the history, commerce and science of drugs for many years.[60] The *Extra Pharmacopoeia,* which became a two volume survey of information not provided in the *British Pharmacopoeia*, was first published by William Martindale and W. Wynn Westcott in 1883. It continues to be published as *Martindale: The Complete Drug Reference.*[61]

The second half of the century also saw major developments in pharmaceutical technology, as well as the introduction of new drugs; patents were taken out on a vast range of equipment for the making and administration of medicines. Indeed, the period between 1830 and 1890 has been described as 'the golden age of pharmaceutical invention'.[62] In Britain official texts often struggled to keep up. Burroughs Wellcome registered the trade name 'Tabloid' in 1884 for their brand of compressed pill; the *British Pharmacopoeia* of 1898 contained the formula for only one tablet, nitroglyerin tablets, which in any case was made by moulding rather than compression.[63]

The fall in popularity of British texts coincided with a growth in European imperialism and increasing competition between European powers. The expansion of the British Empire saw a shift away from translations of pharmaceutical texts appearing on the continent to their use unaltered in the territories of the empire.[64] Pharmacopoeias became not only important symbols of nationalism but also sometimes served other pur-

poses, such as instruments of imperialism.[65] But it soon became clear that pharmacopoeias developed in temperate zones could not be always be imposed unmodified in tropical zones; in 1900 an Indian and Colonial Addendum to the fourth edition of the *British Pharmacopoeia* of 1898 was published. It was swiftly followed by a Government of India edition of the addendum in l901. By the time of the fifth edition in 1914 the General Medical Council felt able 'to produce a *British Pharmacopoeia* suitable for the whole Empire.'[66]

In 1845 Jonathan Pereira emphasised the shifting geographical focus of British pharmaceutical interest in restating the claim for British leadership in pharmacopoeial reform. He declared that

> 'no country in the world possesses so many facilities for carrying on inquiries such as those to which I here allude, as Great Britain. Her numerous and important colonies in all parts of the world, and her extensive commercial relations, particularly fit her for taking the lead in investigations of this kind. Moreover, she is peculiarly interested in such inquires. From her extensive possessions in different parts of the world, we draw a very large portion of the substances now used in medicine'.[67]

Conclusion

This paper has presented further analysis of Cowen's study of the popularity of translations and edited versions of British pharmaceutical texts abroad, from the late seventeenth to the late nineteenth centuries. It is clear from this analysis that a wide range of pharmaceutical texts were translated or reprinted, with newer editions being translated or reprinted following their publication in Britain. At least 260 translations or re-printings of some 30 such publications were produced. The largest number of translations was made of the *London Pharmacopoeia*; there were 54, representing over 20% of the total. But the largest category of publications translated were the dispensatories; there were 135, representing 52% of the total.

Reprints and translations of British pharmaceutical texts were not evenly distributed around Europe and elsewhere. Germany was by far the most enthusiastic translator and re-printer of such texts, accounting for 107 or 41% of the total, despite the fact that it accounted for some of the strongest criticisms. Germany was followed by the Netherlands with 46, Italy with 32, France with 27 and the United States with 22. Together these countries accounted for 234 or 90% of the total. In other countries British pharmaceutical texts had only very limited popularity. It is likely that this pattern of distribution is reflected in the wider medical literature of the time.

There was often a considerable time lag between first publication in Britain and the appearance of the first translation abroad, although this varied greatly over the decades. Although there are likely to be several reasons for this it seems that geo-political events such as wars played an important part. Reprinting often recommenced after the return of peace. The popularity of such texts was not evenly distributed across the seventeenth and eighteenth centuries but fluctuated considerably. It increased slowly in the early part of the eighteenth century and reached a peak between 1750 and 1800, during which period 132, or around 51%, of these publications appeared.

British pharmaceutical texts experienced a different kind of popularity in the late twentieth century. In the post-colonial world many former British colonies chose to adopt the *British Pharmacopoeia.* Today, standards and specifications laid down in the *British Pharmacopoeia* have been adopted in over 100 countries.[68] Britain too found a new use for its pharmacopoeia, as an instrument of economic development and assistance to developing countries and to Eastern Europe; it was a means of helping their regulatory authorities police markets in counterfeit drugs.[69] British pharmaceutical texts thus continue to have significant influence abroad even in the twenty-first century.

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