Natural History, Natural Philosophy, and Readership

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Introduction
Of the six subject categories often employed by book historians (authors, publishers, printers, shippers, booksellers and readers [Darnton 1982:65-83; 2007]) studies of eighteenth-century Scottish works of natural history and natural philosophy have primarily focused on publishers, booksellers and distribution (Wood 2000; Withers and Wood 2002; Sher 2006); less attention, however, has been paid to ‘readers’ and how books reached men and women in specific settings like classrooms, homes and societies. This state of affairs could perhaps be attributed to the fact that many scholars interested in the notion of readership use a canon shaped by literary historians whose vision of the Enlightenment differs from that of scholars studying those mathematical and classificatory works that provide the foundation for the modern natural sciences. Indeed, until recently, the readers of such ‘scientific’ texts were framed in relation to the notions of nature evinced in the works of David Hume, Adam Smith and Adam Ferguson, creating a situation that associates ‘science’ with a philosophical canon and ‘emotion’ with literary texts.

Roger Chartier has argued that ‘special attention should be paid to ways of reading that have disappeared in our contemporary world’ (1994: 8) and with others he has devised methods and questions to investigate how reading a book and reading the natural world need not conflict (Chartier 1994, 2007; Chartier and Cavallo 1999). In eighteenth-century Scotland, formative texts were often the same for both the literary and scientific reader, a situation fostered by the church and state’s firm commitment to education and the relatively high literacy rate that resulted. The pedagogical and social factors that shaped how Scots read books about the natural world thus become just as important as the texts themselves, especially when attempting to understand how the book trade transmitted scientific knowledge during the eighteenth century (Daston 2004: 443-8; Blair 2004: 420-30). In this context, the notion of a ‘book’ includes all printed or bound forms of communication and the notion of a ‘reader’ is not restricted to those who read what later generations determined to be canonical texts; and in recent years there a number of studies which have framed Scottish readership this manner. David Allan, for example, has approached both English and Scottish readers in Georgian Britain through institutions, ownership, marginalia and common place books (2003: 91-124). Acknowledging the high rate of literacy across Scotland’s social classes in the eighteenth century, this study will examine three categories of ‘readers’ associated with science: the young, the proficient and the specialised. Publishers, printers, authors and distributors will be discussed in the context of readership and the delivery of scientific texts. Moreover, the word ‘science’ will be used to refer to all eighteenth-century attempts to systematise the facts and phenomena of the natural world; that is, mathematics, mechanics, pneumatics, astronomy, mineralogy, botany, zoology, meteorology, hydrology and geology.

Young Readers
Until recently, consideration of the child reader and eighteenth-century British books about natural history or natural philosophy usually focused on publications for the London market or textbooks about the modern natural sciences. The works of John Newbery are prime examples – especially his The Newtonian System of Philosophy Adapted to the Capacities of Young Gentlemen and Ladies (1761), written under the pseudonym of ‘Tom Telescope’. Although such books did reach Scottish children, works like Newbery’s were expensive and, importantly, children were more likely to learn about the natural world through less
grandiose educational sources that were often religious in tenor (Fyfe 2000a: 276-90, 2000b: 453-73; Secord 1985: 127-51). ‘Young’ readers in Scotland included children and adolescents, who were taught at home by private tutors or educated in the parish schools, hospitals, ‘private’ boarding schools or academies that abounded in the country. Whatever the institution, the term ‘scientific’ text could have a broad meaning by modern standards, and reflected the religious nature of eighteenth-century Scottish pedagogy.

Most Scots started off their education at home, where literate family members, fellow householders or private tutors introduced them to the alphabet and numbers. The Bible and shorter catechism of the Church of Scotland were prominently used in this process. They were read to children who memorised verses and sections while learning how to recognise parts of the corresponding text. The Edinburgh publisher John Balfour, for example, could recite the entire catechism as a child. Committing texts to memory was a common pedagogical practiced throughout Calvinistic communities in Enlightenment Europe (Allan 1993: 29-78; Jacob and Sturkenboom 2003; Jajdelska 2004). Since the vast majority of eighteenth-century Scots spent at least part of their life in a rural setting (Plant 1952), reading about nature would have been reinforced by their natural environment. For wealthier children, reading practices were supplemented by the new market of children’s chapbooks, cards and lithographs, many of which were imported from London (Demers, 2004). Whether through printed illustrations or actual specimens, acts of nature and landscape scenes were regularly used to mnemonically reinforce the subject matter of the Bible and Catechism. As the overarching aim of instruction was moral in tone, natural objects were consequently infused with teleological significance, once again in common with continental Protestantism (Hessen, 2002). Such a framing of nature instilled a notion of order, wonder and meaningfulness that children took with them into adulthood, thereby encouraging beliefs that would guide their later reading habits and their observational patterns when they turned to the systematically focused practices of natural history and natural philosophy.

Though some households hired private teachers and tutors, children were usually sent to school around the age of five or six. After 1696, all burgh councils were required by law to provide a salary for teaching masters in parish schools and eighteenth-century Scottish newspapers regularly carried advertisements seeking candidates for those positions (Houston 2002: 110-61; Davis 2003). Parish school instruction was free and in most places presbyteries and town councils joined forces by employing Church of Scotland ministers as teachers. Additionally, there were free schools and hospitals for orphans, English (lecture) schools for supplementary instruction, and ‘private’ schools that housed boarders. Although there were sometimes minor variations, the church and state oversaw the curricula of schools and throughout the century arithmetic, geography and navigation were central subjects that introduced Scottish children to the fundamentals of the modern sciences, as testified to by Reverend Dr William Lang in his An Account of Peterhead, Its Mineral Well, Air, and Neighbourhood (1793: 57), sold by William Creech in Edinburgh and by Angus and Son in Aberdeen. Since this was the highest level of formal instruction that most literate Scots would receive, teachers placed a heavy focus upon skills that would help students take up a trade or secure an apprenticeship, which accounts for the emphasis on basic principals of natural history and natural philosophy. This foundation thus enabled literate Scots to build a scientific understanding of themselves, the natural world and society.

On the whole, the arithmetic books used in Scotland were revised versions of works originally published between the 1690s and 1720s, and included Edward Cocker’s Arithmetick (London 1678), Robert Colinson’s Idea Rationaria or The Perfect Acomptant (Edinburgh 1683), and James Paterson’s Scots Arithmetician (Edinburgh 1685). Although there were local textbook traditions for the sciences in several cities, those published in both Edinburgh and London began to coalesce into an informal canon by the 1770s. As early
as 1718, at least three Edinburgh teachers had published locally successful books: Alexander Macghie, *Principles of Book Keeping Explain’d*; Robert Lundin, *The Reason of Accoompting by Debitor and Creditor*; and Alexander Malcolm, *A New Treatise of Arithmetick and Book-Keeping*. Add to this the work of James Watson, John Mosman, and William Brown, all of whom were consistently involved in the production of these and other ‘scientific’ textbooks in Edinburgh. George Fisher’s *The Instructor; or, Young Man’s Best Companion* perhaps best represents the sort of publication history that English textbooks experienced in eighteenth-century Scotland. His book mirrors the curricula taught in many Scottish schools, and its subject matter demonstrates how early instruction affected students who went on to read texts which addressed the natural sciences more specifically.

Although Fisher wrote as an English ‘accomptant’ at the end of the seventeenth century, his book’s popularity encouraged the publication of improved editions throughout Britain well into the nineteenth century. In Edinburgh it was printed by Gavin Alston in 1763 and reprinted by Alexander Donaldson and James Ruthven throughout the last half of the century. Like so many primary school textbooks at the time, *The Instructor* was divided into five sections: the three ‘R’s’ (reading, writing and arithmetic), business law, accounting, methods of measurement (metrology) and ‘gauging’ (similar to modern day interior design and landscaping). At face value, these five subjects might seem to be far removed from the history of science or philosophy; however, metrological tools and analytic methods were directly relevant to systematic natural history and natural philosophy as taught in university or even as discussed in newspapers and coffee houses during the Enlightenment. Methods of measurement and gauging provided a sound basis from which students could move on to Newtonian mechanics, planetary astronomy, physical geography and hydrology. Indeed, it was not uncommon for young readers’ textbooks to give instructions on how to make dials, rulers, quadrants and other types of instruments. The 1773 Ruthven edition of *The Instructor*, for example, included illustrations of instruments printed on inserted pages that could be cut out and glued to a piece of cardboard, thereby forming a ‘paper tool’. In addition to these metrological foundations, young readers were also introduced to analytic practices inherent in the numerical sequences and rules of arrangement employed by double-entry accounting. As several studies of Antoine Lavoisier and other chemists have shown, this method of mathematical exactitude was of direct relevance to the type of gravimetric analysis employed by chemists, apothecaries, miners and industrialists across Western Europe (Poirier 1996; Donovan 1996; Holmes 1998). To help its readers track the weight of substances, *The Instructor* even provided a ‘Table of the parts of Apothecaries Weights’, precisely of the sort used in the trade (Fisher 1799: 76).

Having acquired this sort of introduction to the subject matter, Scottish students with promise or wealth were sent to high schools to learn Latin and sometimes Greek, around the age of nine or ten, with Edinburgh High School perhaps the most prestigious and its five-year curriculum much emulated. Its students were taught to approach the natural world through a course of study set down by the Church of Scotland and interpreted by the town council. Latin and Greek texts were used to address geography, poetry, mythology, and ancient history, reinforcing a Calvinistic appreciation of the order and, especially, the utility of nature (Steven 1849; Anderson 1935; Law 1965: 74-81; Withers 2000b: 72-4). The curriculum’s Greek and Roman authors were eyewitnesses to past historical events and as such their testimony about geography and natural history was still considered a valid form of scientific evidence. Only in the nineteenth century were classical authors permanently removed from the Scottish scientific canon.

These curricular authors crucially reinforced the fundamental Calvinist notion of natural order, a key assumption underlying natural knowledge in eighteenth-century Scotland. Ovid’s *Metamorphosis*, for example, promoted the chain of being, and Virgil’s *Pastorals* underscored the intricate empirical and aesthetic connections between the animate and inanimate world. Once this appreciation attracted the
young reader’s eye to nature, the organisational methods of rhetorical composition advocated by Cicero and the Dutch humanist Vossius helped them to formulate analytic skills of textual arrangement and prepared them for the techniques of classification employed in systematic natural history. The methods used to order both textual and natural commonplaces into useful tables and categories proved to be very helpful to the students when they became adults – especially when they sought to cut through the massive burst of specimens sent to Edinburgh from the colonies and described in the rising number of Enlightenment natural history books. These methods were reinforced over the holiday periods when students lived with family members and read classical authors to each other for entertainment (Arizpe and Styles 2004). By the mid-century, books with scientific matter that had been written for the expanding adolescent market in England were beginning to reach Scotland and included John Newbery’s Newtonian System of Philosophy Adapted to the Capacities of Young Gentlemen and Ladies (1761), Sarah Trimmer’s An Easy Introduction to the Knowledge of Nature and the Holy Scripture (1780), and John Aiken and Anna Barbauld’s Evenings at Home; or the Juvenile Budget Opened (1792-96) (Fyfe 2000a). The rising popularity of such books in the 1770s was duly noted by Alexander Adam, Edinburgh High School’s rector, when he expanded the curriculum to include them. In general, most Scottish high schools more or less followed a similar approach, with rectors making similar additions and giving private tuition in such ‘scientific’ subjects as arithmetic and bookkeeping.

Proficient Readers

Whether a person was part of the middling or landed classes, newspapers played a central role in the acquisition of scientific knowledge by proficient readers or those men and women who were literate, but whose occupation inhibited their ability to buy expensive books or perhaps did not provide enough leisure time for them to pursue a wide breadth of reading. This would include yeomen and tradesmen (with their apprentices and journeymen), farmers, farmhands, servants, engineers, grievers, midwives and apothecaries – many of whom used scientific reading in relation to their occupation (Smout 1990: 366-420). Also available in Scotland’s coffee houses, churches and lending libraries, cheap periodicals made a plethora of subjects traditionally associated with natural history and natural philosophy readily accessible. Indeed, many readers (including some among the aristocracy) saw periodicals as a viable way of promoting scientific knowledge. Newspapers carried metrological notices and tables, accounts of new technologies, advertisements for popular lectures on natural philosophy and accounts of foreign natural objects. Higher up the economic ladder, magazines and gazetteers culled from other periodicals around Britain (and sometimes Europe), as well as including articles by the editors and contributions from readers. The Scots Magazine, for example, emphasized content that addressed the natural world, the human body and chemical experimentation (Clow and Clow 1952; Brown 2000: 64-6). Finally, proficient readers were also attracted manuals, almanacs and handbooks relevant to their field of expertise and public notices that explained how to calibrate or convert units of measurement.

Print played a crucial role in metrological standardisation outside of academic settings. From a quantitative perspective, metrologically focused publications were of central importance to experimentation and commodification, as they paved the way for a common mathematical standard by which material objects could be compared. Indeed, standard weights and measures benefited both science and commerce and helped to bring industry and academia closer together. By the middle of the century, aside from the various local and national acts, the unofficial metrological standard was David Gregory’s A Treatise of Practical Geometry (Edinburgh 1745). In the following decades, John Swindon’s A Proposal for Uniformity of Weights and Measures in Scotland (1779) and John Anslie’s Gentleman and Farmer’s Pocket Companion and Assistant (1802) would also appear in Edinburgh (Connor and Simpson 2004). But, to the chagrin of enthusiastic Newtonians, much of the natural world could not be reduced to mathematical formulæ, and most works of natural history were written in qualitative language. During the first few decades of the
eighteenth century, authors of periodical articles and chorographies usually employed local names in describing plants, animals and minerals. With the proliferation of English translations and summaries of Linnaeus’s *Systema Naturae* (1735), however, the rest of the century witnessed an increase in the descriptive terms promoted by his binomial nomenclature. Although Linnaean terminology was by no means accepted by all of Scotland’s proficient readers, his books became the standard sources to which Scottish periodical articles, manuals, and travel accounts referred when attempting to describe a natural object. In this respect, scientific print not only helped to spread linguistic standards among proficient readers, it also promoted the classification of the natural world though commonly held categories.

Like many smaller European nations, scientific publications in early eighteenth-century Scotland were often a local affair and focused on industrial, medical or natural topics relevant to readers in the Lowlands. During the 1750s and 1760s, however, after the printing lull caused by the 1745 Rebellion, Scottish publishers began to use copyright loopholes to make themselves a formidable presence throughout Britain and parts of continental Europe (Johns 1998: 2003: 67-90). Much of Scotland’s book trade success derived from the publication of popular natural history and natural philosophy books and periodicals for proficient readers. The prime movers in this new type of print culture were learned printers and publishers like William Smellie, William Creech, and James Anderson (Sher 2000:136) who were university-educated and sought to turn academic subjects into popular texts. This transmutation, or perhaps textualisation, took place in many ways, four of which deserve attention.

First, the editor could write or translate a work on his own. For example, Creech wrote statistical descriptions of Edinburgh and its environs, including theories of the earth (*Letters Addressed to Sir John Sinclair*, 1793); Anderson crafted chemically-oriented articles and books on agricultural technologies (*Essays Relating to Agriculture and Rural Affairs*, 1775); and Smellie translated Buffon’s *Histoire Naturelle* and wrote theoretically about natural history (*The Philosophy of Natural History*, 1790, 1799). Second, many publishers either owned or edited their own journal or magazine and they often commissioned local authors to write scientific articles. Throughout its run (1790-4), Anderson’s *The Bee* made public education a mandate, with recurring emphasis on the sciences, and Smellie dedicated much of his time to editing and printing works of popular science (Brown 2002). Editors might also print excerpts from manuscript reports relating to Scotland’s geography, population or natural history that had originally been submitted to the government’s Board of Annexed Estates, the committees of the General Assembly of the Church of Scotland or the Society for the Promotion of Christian Knowledge. John Walker is a good example of a science writer who turned reports first written for all three of these organizations into articles for the *Scots Magazine*, including his reports to the General Assembly on the Highlands and Islands in 1766 (28: 680-9) and 1772 (34: 288-93). Some scientific articles became books or pamphlets after their success in magazines or as papers for learned societies. Walter Ross’s *A Present State of Distillery in Scotland* (1786), for example, originally began as a pamphlet. William Horseburgh’s work on the chemical composition of Hartfell mineral well started as a paper delivered to the University of Edinburgh’s Philosophical Society, was then summarized in the *Scots Magazine* (1754: 373), published as a pamphlet, and finally appeared in volume one of *Essays Physical and Literary* (1754). The migration from lecture (or even conversation) to article, or from book chapters to magazine extract or book reviews, was part of the complex oral and print circulation of scientific knowledge in Enlightenment Scotland. In a related vein, the third form of textualization of scientific knowledge came about when Edinburgh’s learned printers assembled two of the largest scientifically orientated publications in eighteenth-century Britain: the three editions of the *Encyclopaedia Britannica* (1768-71; 1778-83; 1788-97) and Sir John Sinclair’s *Statistical Account of Scotland* (1791-1799). Both publications condensed numerous texts and oral testimonies into accessible articles and, although expensive, they were available to proficient readers through subscription libraries, whose
memberships and policies are treated elsewhere in this volume. For those who did not have access to such libraries, some of the articles were reprinted or excerpted in the local press.

Finally, Edinburgh and Glasgow publishers sometimes waited until authors based in England died and then republished their scientifically-oriented texts. Such was the case with the work of James Ferguson (1710-1776), a Scot and member of the Royal Society, who spent most of his career in London and published a number of popular science textbooks, often with the London-based Scots publishers Andrew Millar and William Strahan.1 Throughout the middle of the eighteenth-century, his cardboard instruments, as well as his books on astronomy, electricity, mechanics and geometry sold widely in Edinburgh, a success that led David Brewster (1781–1868), then editor of the Scots Magazine, to rework the most popular of these as Ferguson’s Lectures on Select Subjects in Mechanics, Hydrostatics, Pneumatics, Optics, Geography, Astronomy, and Dialing, for Bell and Bradfute in 1805, and Ferguson’s Astronomy, explained upon Sir Isaac Newton’s Principles, for John Ballantyne and Co. in 1811. Many books were similarly adapted at the turn of the nineteenth century, suggesting a degree of genuine continuity between the Enlightenment’s and the Regency’s proficient readers of science.

Specialised Readers

As the eighteenth-century progressed, an implicit canon of scientific authors began to form in Scotland through repeated citations of certain texts in university lectures and, consequently, in the papers delivered in academic societies. Thus a group of ‘specialised’ readers of science emerged, who were either university educated or participants, patrons and correspondents of clubs and societies, even in smaller communities such as Perth (Emerson 1979, 1981; Emerson and Wood 2002; Allan 2003). This group drew heavily from the professional class (physicians, barristers, merchants and clergy), the landed gentry, aristocrats, the aforementioned learned book trade, and, later in the century, industrialists (factory owners and agricultural innovators). Although natural history and natural philosophy were taught as separate subjects in different faculties within the universities, Scottish students could attend lectures on any subject by simply paying the professor’s fee and the course reading lists were often sympathetically calibrated to afford connections between subjects and across faculties. The books set in the curriculum were then discussed in the many student and learned societies that existed during the latter part of the century (Risse: 2005, 67-104). It was for this reason that specialized readers often cited the same texts when giving papers for societies and when writing their own publications.

Prior to entering university, Scottish students encountered natural history in the descriptive ways already discussed or through home-grown sources such as Martin Martin’s 1703 Description of the Western Isles (Withers 2000: 69-72; 2001: 69-111). But as taught in Scottish universities, natural history required moving from description to classification. Drawing upon techniques of analytical classification that they had learned in high school, university students familiarized themselves with systematic approaches to arrangement as evinced in Aristotle’s Categories, John Wilkins’s Essay towards a Real Character (1668) and Linnaeus’s Systema Naturae. Next came delving into specialised books, museum catalogues, medical theses, pamphlets and journal articles written about each kingdom of nature. In botanical lectures, John Ray’s Methodus planatarum nova (1682), John Hill’s The Vegetable System (1759-75) and Linnaeus’s Philosophia Botanica were usually cited by professors who included natural history topics in their lectures. For the fabric of the earth, students were referred to Theophrastus, Pliny, Emanuel Mendes Da Costa’s A Natural History of Fossils (1757), Axel von Cronstedt’s An Essay towards a System of Mineralogy (1770) and Torbern Bergman’s 1783 text, Outlines of Mineralogy (Eddy 2004: 373-99). No one author served as a standard for zoology, and Edinburgh’s professors, unhappy with the classifications offered by Linnaeus, devised their own based on personal experience, the testimony of Scots who had travelled abroad or the natural histories of specific places (especially those which addressed European colonies). In general, the
Scottish disagreements about zoological classification were profound, something strikingly evident in the contrast between James Burnett, Lord Monboddo’s *Of the Origin and Progress of Language* (1773) and Henry Hume, Lord Kames’s *Sketches of the History of Man* (1774).

Like students studying natural history, those reading natural philosophy built upon the skills taught to them in parish or high schools, the most helpful being their early exposure to mathematics. In university they were taught advanced geometry through recent works such as the Foulis edition of Robert Simpson’s *Elements of Euclid* (Glasgow 1756). They then moved on to Newton’s *Principia Mathematica* (1687), often guided by Colin MacLaurin’s *An Account of Sir Isaac Newton’s Philosophical Discoveries* (Edinburgh 1748), which formed the textual backbone for Scottish mathematics and natural philosophy courses until joined by Pierre-Simon Laplace’s *Exposition du système du monde* (1796).

With the exception of Maclaurin most of the core texts in the sciences were continental, a phenomenon explained by the fact that only a handful of Scotland’s professors willingly committed their lectures to print. This reticence to publish was justified in part by the student practice of keeping meticulous notes, assisted in turn by the Scottish convention of professors selling lecture outlines which provided the heads and terms of the lectures. The resulting notes (often written in shorthand) were neatly copied out onto blank sheets of linen paper by the student or by a stenographer and then leather-bound into what was effectively a manuscript ‘textbook’. Once in this form, they had the same function as printed books: they were cited in Scottish learned journals, including *Essays Physical and Literary* and the *Transactions of the Royal Society of Edinburgh*, and sold alongside books and bound periodicals at auctions. Cornelius Elliot, for example, lists a bound copy of manuscript notes from Charles Alston’s lectures in his sale catalogue for Professor John Walker’s library in 1804. Dugald Stewart gave his bound copies of Joseph Black’s chemistry lectures to his son Matthew, while Smithson Tennant’s bound notes taken in the courses of John Walker (natural history), Joseph Black (chemistry), and Alexander Monro secundus (anatomy), all from the 1780s, were passed along until they reached the influential nineteenth-century chemist, William Wollaston (Gilbert: 1952). Professors thus did not need to publish textbooks because their lectures, and their unique systematic approach to their subject, were preserved in multiple manuscript editions. This transition from oral instruction to textual representation was one of the hallmarks of Scottish university education, as well as the explanation for the scant to absent publication record of significant Scottish scientists like Joseph Black. For students, the content of a manuscript textbook could be spatially arranged to suit personal needs, a feature that was quite useful when dealing with formidable mathematical formulae or long specimen tables. For professors, this practice prevented the substance of academic lectures from being mass-produced, thereby ensuring high attendance and the increased fees that came along with it, as well as protecting intellectual property. Professors like William Cullen would only agree to print in response to unauthorized publications of their lectures. As material objects, the manuscript textbooks were retained by students as reference tools throughout their adult careers, and then given to children or acquired by collectors and university libraries.²

As the catalogues of Edinburgh’s booksellers indicate, Scots wrote and read much in the areas of natural history and natural philosophy. Charles Elliot handled some 150 medical titles alone between 1772 and 1790 (McDougall 2002: 237-54). As with the reading lists given to students in university lectures, the booksellers’ catalogues include a significant number of foreign texts. And those specialised Scottish readers who could afford to travel, like the Duke of Argyll and his nephew Lord Bute, or aspiring physicians like Andrew Plummer, James Hutton and James Hall, brought back from their European tours reading interests that effectively encouraged the acquisition of foreign scientific texts within Scotland (Eyles 1962; Emerson 2002; Eddy 2002: 430-5). Scottish publishers and booksellers embraced this market when they instructed their agents on the continent to locate and purchase science titles. Many such works were written in either
French or Latin, but if a title demonstrated particular promise, publishers commissioned English translations. The entrepreneurship of Edinburgh’s book trade resulted in (among others) William Smellie’s translation for William Creech in 1780 of Buffon’s *Histoire Naturelle*, Richard Kerr’s translation of Lavoisier’s *Elements of Chemistry* in 1790, again for Creech, and Thomas Beddoes’ translation for Charles Elliot in 1786 of *The Chemical Essays of Charles-William Scheele*. Such books appealed beyond university students to the readership of Scotland’s thriving specialised societies where the initial practice of reading papers created a symbiotic atmosphere in which academicians and savants alike learned about new international trends in science and whereby the book trade could be alerted to those scientific titles that promised a profit. Perhaps not surprisingly publishers and printers figured prominently among the founding members of Lord Buchan’s Society of Antiquaries of Scotland. Some editors who belonged to these societies exercised their business acumen in convincing their fellow members to write articles for their own journals and newspapers, thereby creating a crucial link between the interests of proficient and specialised readers of science.

**Conclusion**

Approaching scientific texts through their readership reveals the quantitative and qualitative practices that moved side by side with each other as a student progressed through Scotland’s eighteenth-century education system and social structure. Accountancy was relevant to chemistry and rhetorical compendiums laid the foundation for the kinds of classifications used in the sciences. Such connections present a more integrated picture of how Scots viewed the natural world in a century in which their country witnessed significant economic, educational and demographic growth; they also suggest that the Scottish Enlightenment engaged the literate population through a communal sense of nature that had been fostered by shared reading practices.

**New sources (cited in the text) that need to be added to the bibliography:**


Risse, Guenther B. *New Medical Challenges during the Scottish Enlightenment* (Amsterdam: Rodopi, 2005).

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1 James Ferguson Papers, NLS, Acc. 10254.

2 Exemplary specimens based upon eighteenth-century Scottish university lectures in natural history and natural philosophy are preserved at the Wellcome Library (London), the Royal College of Physicians (Edinburgh), and in the Aberdeen, Edinburgh, and Glasgow University libraries.
Natural philosophy or philosophy of nature (from Latin philosophia naturalis) was the philosophical study of nature and the physical universe that was dominant before the development of modern science. It is considered to be the precursor of natural science. From the ancient world, starting with Aristotle, to the 19th century, natural philosophy was the common term for the practice of studying nature. It was in the 19th century that the concept of "science" received its modern shape with new titles In Darwinian natural selection, features that do not contribute to the function of the individual vanish over the course of generations, as bearers of such traits lack the reproductive fitness to pass those features on to their offspring. Mill applied a similar argument to ideas: good ideas would survive the rigors of critical debate, but there were no means of discovering which ideas would endure apart from testing them. Implications for philosophy, security and international relations: Human history is full of examples where ideas did not meet the criteria above and were unsustainable, leading to their obsolescence and, ultimately, to their extinction despite the sometimes significant military, economic, intellectual, and political power driving them. See more ideas about Natural philosophy, Natural history and Philosophy. Gaius Plinius Secundus - Google Books. Paul Arblaster. Natural history and natural philosophy. Medieval Natural Philosophy Google Books Vintage World Maps Culture Natural History Signage Bees Illustrations. Thierbuch.