

The birth of scientific reading

The social structures of science were invented to cope with an explosion of printed information.

Adrian Johns

There is a persistent myth about the origin of science. It goes like this: the Scientific Revolution happened when men such as Robert Boyle and Isaac Newton freed themselves from the medieval fixation with words and instead looked directly at things. It is a simple and powerful story that has been much repeated. But it is also quite wrong. Far from emerging from a rejection of words, in fact science originated partly from a need to master as many of them as possible.

What created this need was the development of printing in the mid-fifteenth century. By 1500, more books had been printed than had ever existed before. Different books, too. For the first time since antiquity, readers could encounter Lucretius' atomism, Dioscorides' pharmacopeia, Ptolemy's geography and Archimedes' mechanics. At the same time, the New World furnished a new stock of proclaimed facts — from the medicinal powers of tobacco to the alleged origin of syphilis — that threatened to trump those available in Aristotle. All of these claims to discovery and rediscovery appeared at the hands of a burgeoning crowd of self-appointed authors, often independent of universities and royal courts. As a result, readers faced a problem not just of quantity but of quality — one uncannily similar to that confronting today's users of the Internet. What, among the outpouring of claims and counter-claims, deserved to be accepted as truth? What should one read, and how should one read it?

Writ large, such anxiety threatened to throw the very future of civilization into doubt. French scholar Adrien Baillet warned in 1685 that "the multitude of books which grows every day" would cast Europe into "a state as barbarous as that of the centuries that followed the fall of the Roman Empire". In response, contemporaries rushed to create tools to help the beleaguered reader. The Renaissance thus saw a proliferation of typographical, lexicographical and bibliographical schemes to alleviate the massive oversupply of printed ideas. Konrad von Gesner pioneered them with his mammoth *Universal Library* (1545). Gesner sought to emulate in this multivolume work the ancient Library of Alexandria, which had aimed to garner all the books of the world. By the time his last volume appeared, Gesner's

'library' contained descriptions of some 15,000 works but was still incomplete. Others suggested note-taking methods, routines for memorizing, and procedures for recalling what had been memorized. Still others mooted technological solutions, the best-known being Agostino Ramelli's book wheel. When rotated, this device brought a succession of open books into view, producing a kind of rude mechanical hypertext.

All these solutions had one thing in common. They presupposed that the multiplicity of printed opinions must be reduced to something apprehensible by just one pair of eyes. This soon proved an impossible dream. But there was an alternative: instead of reducing all books to one, why not multiply the capacities of the reader? Sure enough, throughout the sixteenth and seventeenth centuries groups of scholars and gentlefolk began to make reading itself a collective enterprise. Casually at first, but then with increasing formality, they shared out the labour of evaluating new and reissued works among small social groups. The readings that resulted merged the perspectives and expertise of the collaborators into one. Simple as it sounds, this division of readerly labour was also rather new. It would have its most remarkable effect in the period's great learned academies — and in particular in the fountainhead of experimental science itself, the Royal Society of London.

The society took the idea of collective reading and made it a settled part of its programme. It established committees, for example, to read widely in subjects such as mechanics and husbandry, sorting the worthy from the worthless. From this it gained three benefits. First, the reading itself generated proposals for new experiments — which, after all, were the society's *raison d'être*. Second, because collective reading involved bringing varied perspectives to bear, it exemplified the society's claim to be disinterested and undogmatic. And third, it

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The book wheel — ancestor of the Internet.

permitted the fellows to appraise new books on an informed basis. After all, only by knowing what was in the existing literature could the society collectively confirm a proclaimed new discovery as indeed something new. So countless would-be authors — among them Boyle and Newton — submitted their creations to the Society, where they were "perused" by committees. Their shared readings would then be announced before the Society at large, where they would give rise to experiments, conversations, correspondence and, at length, more reading. In this way collective reading became a self-perpetuating process, and one that fuelled the continuing vitality of early science.

The results of all these perusals were often themselves printed, adding still more to the ocean of books. Newton's *Principia* (1687) is the most famous volume to have emerged from the process. More likely, however, contributions would appear as papers in the *Philosophical Transactions*. This was the first scientific journal, and as such it served as the template for a horde of imitators. Some of these claimed to be 'universal bibliothèques' in their own right. They asserted that their limitless reviews and abridgements, produced through the shared reading of contributors, amounted to a dynamic synopsis of human knowledge itself. Thus did the old ambition of Gesner and the Alexandrians reappear, helping to shape a newly commercial — and a newly scientific — age. ■

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