Wise men contemplate the world, knowing full well that they are contemplating themselves.

—*Attributed to Fra Mauro and quoted in Robert Elliott Smith's* Rage Inside the Machine *(2019)*

Man is a creature who makes pictures of himself and then comes to resemble the picture. This is the process which moral philosophy must attempt to describe and analyze.

—*Iris Murdoch, quoted in Frank Pasquale's* The Black Box Society *(2016)*

The shamelessness of the rhetorical question "What do people want?" lies in the fact that it appeals to the very people as thinking subjects whose subjectivity it specifically seeks to annul.

—*Theodor Adorno and Max Horkheimer in* The Dialectic of Enlightenment *(1947)*

1 The Rise of Algorithms in Bookselling

In Jorge Luis Borges's 'The Library of Babel' (2007 [1941]), the universe, also known as the library, is made up of interminable, uniform hexagons each lined with five bookshelves on four walls (see Figure 1). Every shelf contains 35 books, every book 410 pages, every page 40 lines, and every line 80 letters. No two books are the same, and the organizing principle of the library, if there is one, is unknown. Many of the books, made up as they are of seemingly random variations of twenty-five orthographical symbols, simply comprise 'senseless cacophonies, verbal jumbles and incoherences' (53). Although it has not been found, it is speculated that one of the books must contain a faithful catalogue of the library. Following this logic, however, the library must also contain thousands of false catalogues. The inhabitants of this universe – its imperfect librarians – travel through the hexagons, stopping only to sleep standing up or to take care of biological necessities, searching for the one book that might make meaning of the library: a 'catalogue of catalogues'. Some go mad because the possibility of finding such a book 'can be computed as zero' (55).

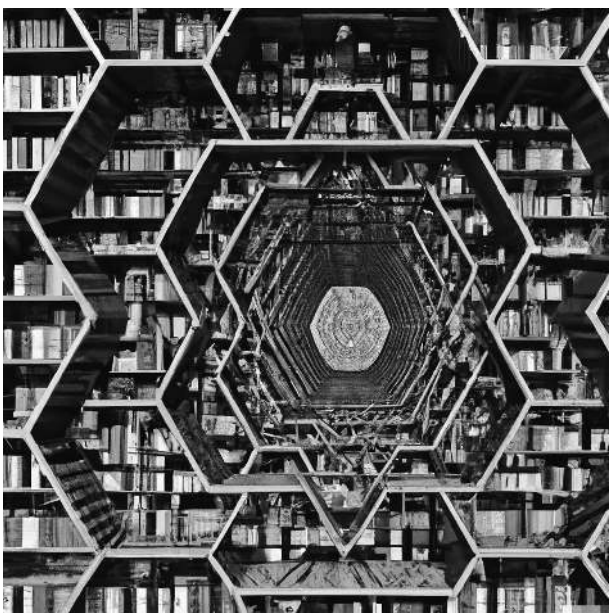

Figure 1 A depiction of Borges's Universal Library created by Derek Philip Au using DALL-E 2, an AI system whose creators claim that it can 'create realistic images and art from a description in natural language'. See derekau.net/blog (16 July 2022).

If Borges's library were, instead, a bookstore I would hazard to guess that it would be uniquely unprofitable. Although readers in a bookstore might hope to browse the shelves in search of a special book, to do so for a lifetime would mean delaying the moment of sale beyond what would be practicable for the bookstore owner, who, after all, must eat and pay rent.

Imagine now that the hexagons of Borges's story are each outfitted with a small console, equipped with a search bar. Entering a string of letters produces a list of books featuring that string along with their locations in the universal library. This might eliminate some of the frustration of the

inhabitants of the library, but it would ruin the story, which tells us that in our (desperate) search for knowledge it's never clear exactly what we're looking for or how to know that we've found it.

This Element is about how algorithms, and particularly search and recommendation algorithms, affect the acts of bookselling and book buying. Although algorithms exist across different phases of book production and consumption and are implemented in both online and brick-and-mortar bookstores, this Element focuses on the rise of Amazon.com, now the largest bookseller in the US, and its use of algorithms in recommending books to readers. This Element is not directly interested in the distinction between selling ebooks and physical books, or the rise of self-publishing, which has taken place inter alia on Amazon's Kindle Direct Publishing platform. It also brackets the role of algorithms on platforms like YouTube and Instagram that influence the sale of books through marketing (see Fuller and Sedo, 2023). Instead, this Element asks what is at stake for book buyers and sellers when readers take recommendations from bookselling algorithms online.

A Very Brief History of Bookselling in the US

Starting in the late 1960s, bookstores in the US began changing. Books had been sold in one-off, independent stores owned by local booksellers near the centre of towns, cities, and neighbourhoods, but they now moved off main street towards the growing malls and shopping centres. Following trends in other retail sectors, bookstores began capitalizing on their new, high-traffic locations by rationalizing stock management, which meant increasing stock turnover and stocking only books with a high likelihood of selling quickly (Thompson, 2010).

By the 1980s, these efforts were aided by rapid technological changes that increased efficiencies in predicting sales and turning over stock (Miller, 2006). These computerized systems, which recommended to booksellers what books to stock and for how long worked best at scale, and bookstore chains proliferated, taking the place of previously independent stores. Whereas the independent stores had been shaped by the knowledge and interests of individual booksellers and their understanding of the communities in which they operated, chains often featured the same, fast-selling titles across their locations. A chain store in one US mall was likely to feature much the same stock as the same chain store in a mall across the country (Thompson, 2010).

The proliferation of the chains came to a head in the 1990s with the rise of superstores. In 1992, the retail giant Kmart bought Borders, which had itself bought the bookstore chain Waldenbooks in 1984. Under Kmart's ownership, Borders and Waldenbooks merged to form Borders Group, which went public in 1995 and began to compete with the other superstore chain, Barnes & Noble. In the late 1990s, Borders and Barnes & Noble dominated the bookselling scene, outselling their closest rivals, the chain bookstores Crown and Books-a-Million, by a factor of anywhere from five to ten (Thompson, 2010). Like the chains, these superstores were able to maximize margins with computerized stocking systems, but they were also able to stock far more books in their super-sized footprints, which made them attractive to consumers looking for a one-stop book-buying experience.

This boom of nationwide bookstore chains and the competition they produced increased the availability of a large selection of books to more US Americans than ever before. The cost, however, was a decrease in independent bookselling. By the end of the millennium, chains accounted for over 50 per cent of book sales, while the sales of independent bookstores fell from 24 per cent of total book sales at the start of the 1990s to around 16 per cent by the decade's end. By 2006, independent bookstores made up about 13 per cent of total book sales in the US (Thompson, 2010). As the growth of the superstores slowed and even regressed in the first decade of the twenty-first century, the total number of bookstores began to fall. Although US Census Bureau figures (quoted in Miller, 2011, p. 18) tend to undercount totals, their numbers of dedicated bookstores dropped from 12,363 in 1997 to 9,955 in 2007. Of the 905 bookstores that closed between 2002 and 2007, 764 were independent stores with only one location. It is in this context that Amazon.com started selling books online.

The Emergence of Amazon

Amazon first started selling books online in 1995. Originally this was a very low-cost proposition. All it required was a website, packing materials, and use of the postal service. Customers went online and ordered books through Amazon.com, which were shipped to founder Jeff Bezos's small team from a wholesaler. The team then repackaged the books into customers' orders and sent them off. When Amazon went public in 1997, investors flocked to the

offering, injecting large amounts of capital into the startup even though it had not yet shown signs of profitability. As sales increased, Amazon built its own distribution infrastructure, which allowed for quicker shipping times (Miller, 2006). As with the rise of the superstore chains, Amazon was increasing access to books (for customers with credit cards and internet access), and, for customers who didn't need their books right away, it increased the convenience of the purchase by not even requiring them to leave their homes. Although the book superstores had already made books much more widely available, Bezos's focus was on further expanding selection. Amazon.com provided, as Bezos writes in his 1997 shareholder letter, 'much more selection than was possible in a physical store (our store would now occupy 6 football fields)' available in 'a useful easy-to-search, and easy-to-browse format in a store open 365 days a year, 24 hours a day' (Bezos, 1997).

Why did what is now called *the everything store*, start out as a dedicated bookstore? Laura Miller (2006) points out that a history of successful mail-order sales demonstrated that buyers didn't need to handle books before purchasing them. Plus, Amazon was able to easily adopt *Books in Print* as its catalogue, transforming Bowker's indexical codex into a scrollable and searchable database. Books are relatively uniform in size, making the shipping and distribution process standardizable and inexpensive. As Matthew Kirschenbaum (2021, p. 81) writes, there is nothing logistically distinctive about books: they are 'amenable to just the kind of modularization supply chains demand'.

Although these factors all point to books' interchangeability (as John Thompson (2021, p. 143) notes 'a copy of a book was the same as another copy of the same book regardless of where you bought it'), books were a good testing ground for e-commerce because of the large number of distinct titles. Fortuitously, despite their diversity, books already came pre-stamped with individual International Standard Book Numbers (ISBN), which made them easily trackable. Mark McGurl (2021a) writes that in choosing books as its proto-product, Amazon was taking advantage of the fact that reading for pleasure was a pastime afforded to precisely the population that was most likely to have access to a credit card and an internet connection.

The choice of books then was, as Thompson (2021, p. 143) writes, not related to a desire to 'participate in and contribute to the culture of the book'. Books were simply well-suited to maximize the potential for rapid

growth at the start of the e-commerce boom. Yet McGurl (2021a, pp. xii, xix) suggests that books represent a choice more meaningful than this narrative reveals, and that Amazon's start as a bookstore is embedded in and central to its commitment to 'facilitat[e] our access to fiction in various ways'. This fiction manifests itself in Amazon's authorship of 'an epic narrative' that follows 'the speedy satisfaction of popular want'. We can see the opening of this narrative written into the 1997 shareholder letter, where Bezos contends that although it is 'Day 1 for the Internet . . .. Tomorrow, through personalization, online commerce will accelerate the very process of discovery'.

The idea of accelerating the process of discovery through personalization is something I'll return to in section 3. For now, we'll turn to the more banal yet monumental acceleration of Amazon's growth through the start of the twenty-first century. In 1995, Amazon's revenues were half a million dollars. This rose to $16 million in 1996, its second full year of business. In 1997, Barnes & Noble started competing with Amazon for online book sales. Despite this, Amazon became, in just three and a half years, the country's third largest bookseller behind Barnes & Noble and Borders (Hennessey, 2000, p. 39). The company, though, remained unprofitable, posting huge losses along with its mega-sales numbers. Kept aloft by shareholders and investors, the company focused on Bezos's motto: 'get big fast'. And it did. Amazon first became profitable in 2007. By 2010 Amazon's media sales, which include sales of books as well as sales of TV shows, music, and digital downloads, were $6.88 billion and growing rapidly. The sales of its closest competitor Barnes & Noble, were under $4.55 billion and falling (Thompson, 2021, p. 145).

Although it was launched as an online bookstore, Amazon steadily increased its retail offerings and by 2014 only 7 per cent of its revenue came from books (a number that has likely fallen since). That 7 per cent, however, constitutes roughly half of all US book purchases and 70 per cent of all ebook purchases (McGurl, 2016; Greco, 2019; Thompson, 2021). A SWOT analysis, created by an independent firm usually in the service of investors, is an overview of a company's strengths, weaknesses, opportunities, and threats. A recent SWOT analysis (Marketline, 2022) of Barnes & Noble lists as its major competitors Amazon.com, Books-A-Million, Costco, Target and Walmart. A SWOT analysis of Amazon, which grew

21.7 per cent in 2022 due to increased sales and the promotion of Amazon Web Services (AWS), a cloud-computing platform used by companies like Coca-Cola, Netflix, and BMW, doesn't even mention Barnes & Noble as a notable threat (Marketline, 2023).

These numbers are all to say that Amazon has become in the last few decades a powerful if not the most powerful player in the bookselling industry in the US. It has become the single most important customer of many university presses and small publishers, and one of the two or three largest accounts for the large trade publishers. The norms Amazon has introduced, such as free shipping, short delivery times, and extreme discounting, have put pressure on publishers and booksellers to fall in line or risk losing customers (Thompson, 2021).

Although I have framed Amazon's rise here in terms of the history of bookselling in the US, Amazon's effects on bookselling have also been global in scope. Amazon has major fulfilment operations in thirteen countries and distributes books and other products to customers in at least 150 countries. Amazon's newest successful venture, AWS, which has clients in 190 countries (McGurl, 2021a), draws on Amazon's experience in distribution: both cloud computing and global logistics are only profitable at a large scale. In the UK, whose bookselling history closely parallels that of the US with Waterstones and Dillons standing in for Barnes & Noble and Borders, Amazon is a major player (Thompson, 2021), as it is in many other countries, particularly in Europe and Canada.

Amazon's Algorithms

How is Amazon so effective and competitive at selling books online? Consider this anecdote furnished by David Sumpter:

> When I look at the books suggested for my favorite authors, the recommendations are spot on. Either I already own the book, or it is one I would like to get my hands on. During the two hours I just spent on Amazon's website 'researching' their algorithms, I ended up putting seven items in my basket. The algorithm understood not just me, but also my wife and my

> relatives. I just did all my Christmas shopping in one sitting. It even understands my teenage daughter better than I do: when I looked up Dodie Clark's book *Obsessions, Confessions and Life Lessons* it suggested that Elise might also like *Turtles All the Way Down* by John Green. I am sure she will.
>
> When I read fiction, I hear another person's words in my own voice. It was a very personal experience, a social connection between me and the writer. Sometimes when I am deep in a good novel, I believe that no other person will ever talk to me in the way this writer has talked to me.
>
> A few hours on Amazon dispels this illusion entirely. (2018, p. 106)

This anecdote highlights several of the tensions produced in our interactions with algorithms that this Element will probe. Sumpter sees the personalized recommendations offered on Amazon's site as uncannily accurate. They mirror his existing purchasing habits by offering him books he has already bought or books he plans to buy. As a professor of applied mathematics, Sumpter is not perplexed by how Amazon achieves this; he knows that there are algorithms working to produce the site as he sees it real time, hoping to increase his purchases. Despite this, it works. He accepts many of these recommendations, purchasing several of the items. And not only do these algorithms seem to understand Sumpter, but they also provide him with recommendations for others, such as his teenage daughter. Sumpter is confident in this algorithmic recommendation; he is sure his daughter will enjoy the book. All of this is extremely convenient. His Christmas shopping is done in one sitting.

Literature, as Sumpter notes, can also feel personalized. It hails readers as subjects of its fiction: a story cannot really exist in the world without the active participation of a reader. Algorithms, as I'll argue in the next section, are similar in that they are texts that cannot operate without the input of users. Both our reading of literature and our interaction with algorithms, as Sumpter notes, seem to reflect our subjectivity back to us. Sumpter's few hours on Amazon dispel for him the uniqueness of the connection afforded by literature by seemingly replicating that connection easily and repeatedly

with every click of his mouse. To what extent is this the case? What do we gain and what do we lose by accepting algorithms' instant recommendations? These are the questions that this Element aims to address.

If Sumpter's account is credible, Amazon's algorithms are effective at selling books, and, among factors like a huge selection, incomparable convenience, and competitive prices, are part of what has set Amazon apart as a bookseller. Amazon's product recommendation system was one of the first modern algorithms 'deployed at scale for consumers', as Mikhael Bhaskar (2020, p. 16) writes enthusiastically: 'books were in the vanguard!' As early as 2008, Amazon used eighteen different types of recommender systems on its website (Knotzer, 2008). Although the goal of this Element is to elucidate the effects of algorithms on bookselling, it is the case that we can't be sure what proportion of Amazon's success is attributable to its data collection and use of algorithms. However, the selling of books with algorithms is part of what Amazon itself calls the 'flywheel' or self-reinforcing loop that powers its business: lower prices lead to more customer visits, more customer visits lead to more sellers, which, in turn, lowers the relative fixed costs of fulfilment centres and servers (Stone, 2013, p. 98). Amazon's aim is to accelerate the flywheel, and technologies like the 'buy now' button or the outputs returned by search and recommendation algorithms decrease friction, lubricating the flywheel.

Although Amazon has had incredible impacts in the world of bookselling, Bezos himself calls it 'a technology company at its core' (quoted in Striphas, 2010, p. 303). This is why Amazon's closest competition is not Barnes & Noble. Instead, it is listed as one of the GAFAM/BATX companies, which is an acronym referring to Google, Apple, Facebook, Amazon, Microsoft, and Baidu, Alibaba, Tencent, and Xiaomi. In 2022, the Forbes Global 2000 list of the largest publicly traded companies had Apple seventh, Google (Alphabet) eleventh, Microsoft twelfth, Alibaba thirty-third, Tencent twenty-eighth, and Facebook (Meta) thirty-fourth. Amazon was sixth (Murphy and Contreras, 2022). Like these other companies, Amazon, although not invested in the culture of the book, is primarily concerned with, as Ted Striphas writes, 'delegating the work of culture – the sorting, classifying and hierarchizing of people, places, objects, and