BiblioTech

ReReading the Post-digital Library

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Torque Editons

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Introduction

Books are interfaces to libraries. Libraries are interfaces to books. Today, both are also pervaded by elements of the "meta-interface" of new platforms, cloud storage, and data streams that has diffused out from desk-based computers.[1] Reading, writing, publishing, distributing and storing books have each become more connected in the digital context, embracing an ever-wider infrastructure ecology[2] of human and non-human actors. If libraries and books both seem somewhat dwarfed by the resultant "accidental megastructure" stretching between the world and the end user through a *stack* of interface, address, city and cloud,[3] an ability to *practice* librarianship doubtless has become ever more central to surviving its symptoms: the informatic tornados that rise through the semio-economy threatening the composition of intellectual solidarity with ever-increasing volume and speed.[4]

The contemporary public realm is a bloated library teeming with the manifold, chaotic, outputs of the publishing "attitude" of contemporary culture.[5] Libraries have, as a result, turned inside out: shaking off the narrative of loss and preservation that has characterised earlier bibliotechnical periods,[6] pivoting towards filtering, broadcast, "organizing information outward" into a world which forgets nothing,[7] and hybridising the outside inward by integrating various living components into their architectonic designs. Books are also in a somewhat liminal state: the emblematic "transaction between physical and mental universes", now itself occupying various states of im/materiality, and even executability. Our own limits seem increasingly indistinguishable from that of our representative digital subjects[8] but a book, even in its digital form, as a "text with limits, which can be divided into organised contents"[9] still operates as a wedge for separating us from the network, teasing chucks of the infinitude of information back to the limitations of the material world – albeit one that may additionally function as a connector, leaking more content into the big data repository. As all this suggests, shuttling between books (whatever form they are taking) and libraries (however porous and topsy-turvy) we encounter a great deal of insight about knowledge production, resource distribution and power in contemporary society.

Building on a rich tradition of historical and contemporary work on the *library-book*,[10] *book-art*,[11] and *art-library*[12] relations, this edition reflects

1. Christian Ulrik Andersen and Søren Bro Pold, *The Metainterface: The Art of Platforms, Cities, and Clouds* (MIT Press, 2018).   **2.** Shannon Mattern, "Library as Infrastructure," *Places Journal* (2014).   **3.** Benjamin Bratton, *The Stack: On Software and Sovereignty* (MIT Press, 2016).   **4.** Franco 'Bifo' Berardi, "Semio-capital and the Problem of Solidarity" (2012), https://libcom.org/book/export/html/45057.   **5.** Alessandro Ludovico, *Tactical Publishing: Using Senses, Software, and Archives in the Twenty-First Century* (MIT Press, 2024).   **6.** Brian Cummings, *Bibliophobia: The End and the Beginning of the Book* (OUP, 2022).   **7.** Mark Dahl, "Inside-out Library Services," *Advances in Library Administration and Organization,* Vol. 39: 15–34.   **8.** Olga Gorbunova, "The Digital Subject: People as Data as Persons," *Theory, Culture and Society,* 36, no. 6 (2019): 125–145.   **9.** Cummings, *Bibliophobia.*   **10.** A recent article by Adam Smyth in the LRB makes the connection between Brian Cummings' *Bibliophobia,* Holbrook Jackson's 1930 "digressive celebration" *The Anatomy of Bibliomania* and Thomas Frognall Dibdin's 1804 "masterpiece" *Bibliomania; or Book Madness.*

upon and documents our own experiment with librarianship undertaken via the curating of exhibitions in NeMe, Cyprus and Exhibition Research Lab, Liverpool in Spring 2022, which transformed galleries into a temporary and distributed library,[13] showcasing books and collections as artworks, and artworks as library-infrastructural things. Our library operated as an affective, *scholarly technics* to explore what libraries might feel like in a coming, post-digital age. Through events[14] and exhibition tours,[15] we highlighted the ways that post-digital artist books, book- or library-adjacent art, including the ephemera of public and private library spaces, can be brought together as a modular knowledge production unit to examine and play with today's biblio-technical situation. And now, you hold in your hands, or have before you on screen, an intermediation[16] with those instances of experimental literature, critical librarianship, constructed languages, and alien indices – our own moment of librarianship iterated as a book.

In this book, we document several auto-critical art projects, art writing practices, and spatially organised artworks based in and around the contemporary library, looking particularly at the interfacial and interstitial qualities of books, libraries and the various lives that hybridise with them. The book is in this way an auto-biblio-*technical* exercise in mapping the hybridity of the bibliographical, technological and social aspects of the exhibition: its auto*bibliography*. As our contributors collectively show, in the case of the library, organisational and administrative systems, the behaviours of people and technologies, and the interplay of information and knowledge often give the appearance of a space in which much is automated for efficiency – even a given trajectory of development – but the reality is more contingent and fragile, and our assumptions should often be revised in interplay with the practical experience of the texts and techs of an age.

Contributors to this volume draw attention to the increasing significance of interfaces and infrastructure in accounts of the library. We feature illustrated essays, interviews and artist pages that look backwards and forwards through the history of book storage, making and distribution in surprising and challenging ways. The discussion in the volume also acknowledges the broader landscape of publishing and knowledge production, encompassing websites, social media,

11. See: Garrett Stewart, *Bookwork: Medium to Object to Concept to Art* (Chicago UP, 2011); also Philip Smith, *The Book: Art & Object* (1982); and Alessandro Ludovico, *Post Digital Print* (Onomatopee, 2012). **12.** See Heide Hinrichs et al., "Shelf Documents: Art Library as Practice," (Royal Academy Fine Arts Antwerp, 2021); Anna-Sophie Springer and Etienne Turpin (eds.), *Fantasies of the Library* (MIT Press, 2018); and Ludovico, *Tactical Publishing*. **13.** In *Tactical Publishing* Ludovico describes "temporary libraries" and "distributed libraries" as potential conditions by which the library might find its contemporary relevance in the digital age. Ludovico is also a librarian of temporary libraries himself, as documented in this excellent book. **14.** A selection of talks given at NeMe by Nathan Jones, Sam Skinner, Silvio Lorusso and Rosa Menkman, can be streamed via NeMe's YouTube channel here: https://bit.ly/biblioneme. **15.** A virtual tour and talk by Nathan Jones for Academic Libraries North given at Lancaster University, prior to a workshop with that network, can be viewed here: https://youtu.be/51EkVo9tyWo. **16.** N. Katherine Hayles, *Electronic Literature: New Horizons for the Literary,* (University of Notre Dame Press, 2008). In this book Hayles offers an adaptation of Boulter and Gruisin's more commonly used notion of "remediation", suggesting that "intermediation" better highlights the dynamic relationship between different mediums as books adapt to hybrid digital-physical environments.

file sharing, data farms, cognitive labourers, word processing engines, and even forests. The deeper integration of corporate, automated entities into the network of book production and storage, poses a particular challenge for those of us invested in democratising book access and production cycles. This introductory chapter emphasises the importance of addressing such challenges, and offers vectors for doing so.

The Library and Post-Internet Space

For the majority of writers and artists appearing here, the library is personal precisely because it is where the cognitive and creative conditions of our trade appear to have found their last, albeit fragile, refuge. As Søren Pold and Christian Andersen note in *The Metainterface*, "tablets, fast networks, cloud computing, and more are not only technological advancements; they also seriously disturb and alter everyday cultural practices".[17] In this sense, libraries become not only physical spaces for the accumulation and dissemination of knowledge, but also symbolic representations of the tensions between tradition and innovation, solitude and community, and autonomy and control in the present iteration of the cultural and creative industries.

Historically, libraries have been seen as places of knowledge, learning, and reflection, in which human traits of intensive work, quiet contemplation, and bounded sociality thrive, but this is also enmeshed with the technics of language, archiving, and knowledge distribution in a given age.[18] As a site for storage, recall, researching, and transmission, libraries are a *learning commons* and act as gathering points for tech and folk – a networked membership club, the first info-oases, places in which the internet was first publicly accessible in most campuses and neighbourhoods and therefore a space of self-care and self-discovery for societies of outcasts of various stripes[19] – in ways that echo the practices of earlier nomadic cultures.[20] In fact, can we glimpse a pre-history of the library in the immersive information spaces of the Paleolithic era? Research has suggested that caves operated as sites for gathering and "cross-modality information transfer" between nomadic peoples' speech, echoes, and their notation,[21] and the cave interior became a site for invention, archiving complex symbolic forms for later consultation, ritual meetings, and immersive study, in a manner that anticipated the combinations of scriptorium, networking space and

17. Pold and Andersen, *The Metainterface*.   **18.** Jesse Hauk Shera, "The Library as a Social Institution," *Libraries and Society,* Robert D. Leigh, Jr. and Burton R. Clark (Sage, 1970): 1–22. **19.** In *The Library Book* (Counterpoint, 2018) author and librarian Stuart Kells notes that libraries have long been more than just repositories of books. He writes, "Since ancient times, libraries have been places of learning, of scholarship, of conversation, and of public life. They have been venues for exhibitions, performances, and lectures. They have been centers of community and of civic pride". Similarly, scholar Ray Oldenburg argues, in *The Great Good Place* (Hachette, 1999) that libraries are "third places" – that is, places where people can gather and interact outside of their homes and workplaces. These ideas reflect the long-standing role of libraries as not only places to access information, but also as community hubs and spaces for personal growth and development.   **20.** Artist-turned archaeologist Carolyn Boyd in *The White Shaman* (University of Texas Press, 2016) specifically describes caves in South America as libraries, acting as archives and retrieval sites for performances that are recorded as marks and annotations on the cave walls. **21.** Shigeru Miyagawa et al., "Cross-Modality Information Transfer: A Hypothesis about the Relationship among Prehistoric Cave Paintings, Symbolic Thinking, and the Emergence of Language," *Frontiers in Psychology,* vol. 9, 20 February 2018.

archives of the modern library. Indeed, libraries are still very much immersive environments, whose architecture acts as a portal to embody information structures. Making an additional *paleocybernetic*[22] link between the pre-history and future of the library, Alessandro Ludovico asks that we consider librarians today as information shamen: spirit guides into the network who "help others with their knowledge and mediation between the known (material) and the unknown (immaterial), and they are able to navigate the complexity of forces and relationships."[23] These associations – isolation, community, technical, personal, organisation, innovation and magic – make the library the perfect model for an art exhibition that seeks to twist and satirise the technology shaping social aspects of learning. It does however, also mean that libraries are at the forefront of a kind of paradoxical transformation: the library-condition or becoming-librarian that appears to infest us, and follow us around. Or that we have all awoken to find ourselves to be a librarian-like creature, like Gregor Samsa transformed into an insect. The librarian and the library is an exalted figure in our age of publishing writ large.

Just as the library and librarian are promissory figures of desire, of order, they also now represent our abject everyday. As our lives become more interconnected with the digital and the global economy, local boundaries between work and leisure fade, and formal spaces of learning dissolve into the ether. What Gerald Raunig calls "factories of knowledge" and "industries of creativity"[24] have today been diffused into train carriages, cafeterias, studio-spaces that double up as homes, and hotdesking facilities where the neoliberal sense of time ± space collides. Because we are networked, we are nomadic; always becoming library even while enjoying our leisure.[25] Scholars, in this context, as N. Katherine Hayles has observed, assume nomadic cognitive tactics also – combining traditional "close" reading with the click and scroll, search term hunt of "hyper" reading, and availing themselves of various machine-enabled data summary tools to read (and be read) more efficiently.[26] While watching a short video of a politician falling over, or a cat high-fiving people in a gym, we are *making* valuable data, alongside more visible acts of summarising, annotating, writing, remixing, tagging, registering, categorising and bookmarking diverse combinations of digitised text-like materials. While referring to facets of an individual's readerly capability, Hayles' observation that "close, hyper, and machine reading … can be made to interact synergistically with one another"[27] evokes for us the way that education infrastructure kludges individuals *together* in post-digital space, *into* workable, *always* contingent collaborative entities. Co-working spaces infused with cloud services synergise reader-writers into living libraries, telescoping our interior lives down through yet another data-deep axis. Blandly aware of these manipulations, we socielax on the job, blurring the lines between performative protest, aesthetic friendship, and clickspertese

even further: close reading social profiles, hyper reading job applications and machine-inputting variables to be serviced cash and sociality by the network that reads and annotates us.[28]

In interior designs formerly defined by the library's contents and the society the library serves,[29] libraries have responded to a state of confusion between limitations of content and the infinitude of social networks by simultaneously internalising and externalising their meta-inter-facial nature: they have acquired the texture of simulacra, living post-internet artworks,[30] manifesting most evocatively as clusters of lime green easy-clean cushion-less sofas, perhaps surrounding an unlikely tree, plugged into the ground among the ethernet and power cables, posters or magazines, and futile cabinets. In other words: libraries already were what our entire world seems *designed* to become. And now libraries operate as a kind of caricature of them- and our-selves, and their progenitive influence, mediating between competing states of *becoming library*. Our use of booths and monitors, cables and wall hangings, alongside multiple access points to immaterial space, within the *BiblioTech* exhibitions, performed these webs of influence and became an unconsciously ironic design, at once a very typical-looking contemporary gallery space, and a kind of institutional critique on our own places and technologies of work. Which is to say, if our exhibition, in trying to look like a library, also looked like post-internet art, then the artworks, while being about books, shelves, and collections, were also about the working conditions of the artists themselves.

Hybrid Library and Post-Digital Art

A major consideration within library management to which our own library of alternative libraries can be applied is the 'hybrid library'. A hybrid library is a term that has been in circulation since the late-1990s[31] to define a set of principles for combining traditional library resources, such as print books and journals, with digital resources, such as e-books and online databases. The intention of hybridity in this context is that each are combined in a continuum of manifest availability. In a hybrid library, users can access physical and digital materials through a single integrated system: searching the library catalogue for a book, finding print and electronic formats of that book, and perhaps searching through the digital one before taking the print book home for deeper reading. Hybrid libraries frequently offer access to digital resources, such as online journals and newspaper registration, and membership to media databases such as the BFI or ArtBase. Alternatively, in the case of contemporary art magazines it is cheaper for libraries to make a single physical copy available than pay for an institutional digital subscription, thus print and digital mingle and manifest in different ways.

A project called Lancaster Digital Collections, provides digital access to collections that are also held physically by Special Collections and Archives. In this project (itself fundamentally diffuse and distributed in ownership, being a partnership with Manchester and Cambridge Universities), Lancaster University aims to make the collections resulting from the work of its researchers openly available, but also to assert their unique ownership of the digital versions that

22. Gene Youngblood, "Paleocybernetics: The Creative Imperative," in *Expanded Cinema* (Dutton, 1970). **23.** Ludovico, *Tactical Publishing*. **24.** Gerald Raunig, *Factories of Knowledge, Industries of Creativity* (Semiotext(e), 2013). **25.** Sherry Turkle, Alone Together: Why We Expect More from Technology and Less from Each Other (Basic Books, 2011). **26.** N. Katherine Hayles, "How We Read: Close, Hyper, Machine," ADE Bulletin, No. 150, (2010): 62–79, which quotes James Sosonoski's 1999 definition of hyper-reading: "search queries (as in a Google search), filtering by keywords, skimming, hyperlinking, 'pecking' (pulling out a few items from a longer text), and fragmenting", to which Hayles' adds "juxtaposition" (comparing across several open windows) and "scanning". **27.** Hayles, "How We Read".

28. See, for example Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (Profile Books, 2019). **29.** Nolan Lushington et al., *Libraries: A Design Manual* (Birkhäuser, 2016). **30.** Perhaps in the manner of Joshua Citarella's *Compression Artefacts installation* (2013), http://joshuacitarella.com/artifacts.html. **31.** Chris Rusbridge, "Towards the Hybrid Library," *D-Lib Magazine,* (July/August 1998).

would otherwise circulate freely online. Physical collections are held within the Special Collections area of Lancaster University Library, but material is also accessioned, catalogued, and digitised, in activity funded under the auspices of open access, whereby the collection functions as a kind of broadcast channel and public service announcement proclaiming and making accessible the utility of the university.

One of the key advantages of a hybrid library for its proponents is the flexibility it provides for servicing larger groups of users. Users are given access to materials whether or not they visit the institution in person, reducing the footfall and pressure on in-person aspects of the service.[32] The convenience of accessing an e-book from anywhere with an internet connection means that a reduced, more categorisable, species of user visit the site, and help can also be provided in a distributed fashion, perhaps from less expensive real estate. In addition, hybrid libraries provide greater accessibility for users who may have physical limitations that make it difficult to visit library sites. For proponents, the hybrid library is an approach to academic library services that recognises the value of both traditional and digital resources that seeks to provide users with a seamless and comprehensive library experience. Furthermore, they suggest, the hybrid approach caters to the physical, emotional, and mental well-being of contemporary users, conveniently correlating with the university's corporate concerns. Indeed, hybrid library is a term almost exclusively used from such a position.

Importantly, what typifies the hybridisation of the library most of all is not the hybridisation of digital and analogue, it is the combination of information-space, work-space, the leisure or social functions of libraries, and their interconnection with wider environments; the making conscious of collections, and the collecting of human cognition.[33] Notwithstanding the common pitfalls of automation (for example the high degree of obsolescence in the systems that support it), universities have been quick to install apparatus that free human staff from traditional, easily automated functions. The physical buildings are themselves hybridised with the network by this activity. Self-service technology, such as self-checkout stations, digital kiosks, and interactive displays, cameras and projection screens infuse the more traditional racks of shelves and study desks, and bespoke apps are carried providing user-staff inter-facing via phones and tablets as they 'roam' inside and out of the building. Indicating the extent to which the concept of the hybrid has fed into the life of the institution, Lancaster University Library Festival, consisting of live music, demonstrations and social events, was also available both in the library and online via YouTube during the Covid-19 lockdowns. High quality recordings have also remained on the platform through the intervening years, somewhat shifting the meaning of that casual annual staff showcase. At Lancaster, the integration of the library into its

environment of wires is also augmented by green-tegration: a tree grows in the central study area, and a south facing interior wall is covered in moss-like plants. In turn, these initiatives are entangled with digital technics: periodic flare-ups of white fly trigger email alerts and are attended to by staff newly liberated from face-to-face encounters, perhaps on their way to the periodic *Living Mental Health Library* where they hear all about symptoms of living under these conditions, from a self-help audio book made of flesh.

At other institutions the notion of hybridity moves along different vectors: York University have provided a 'family study room' where parents can simultaneously work and care for their children.[34] Alongside Oxford Brookes University library main reading rooms is a huge atrium, an empty void – architectural ideology in action – intended to inspire via an affirmation of space and hybridise with the density of the adjacent texts perhaps. There is also a mindfulness space where you can do jigsaws, and eating and drinking is allowed in most spaces. It is notable that the library is busier than the university cafes and bar spaces. Thus, while the office falters, the library, the original hot-desker and networker appears to thrive, for its captive market at least.

Benjamin Bratton warns that, though it might be tempting to refer to this design principle as one of analogue digital hybrids, hybridity offers ill suited, confusing, and somewhat impoverished, metaphors for the new phenomena arising from a world at the service of planetary scale connectivity: "In the short term, hybrids may make sense by way of analogy and continuity, but soon they create confusion, and even fear, as the new evolves and resembles the familiar less and less. Hybrid terms delay recognition and defer understanding of what requires our most audacious attention."[35] Bratton calls, instead for a new glossary of design perspectives, specifically speculations on the 'new normal' to which technology seems to be leading us. For us, this too can lead to confusion – are the designs of the speculator predictions, prototypes, or horror stories designed to lead us away from what seems to be our predestination? Better, we think, for our purposes at least, is the mode of post-digital art, which deploys what we already have at our service, naming and using it in ways that allow its legibility to come to the fore.

Post-digital art is a set of practices that may not necessarily be digital themselves, but reflect on the digital condition by doing things with the materials we remain surrounded by. What is important about this in the context of our project is that the essence of library-ness is materially embodied. Not just books, but spaces for people, and interactions between people, devices, and technics such as shelving units underpin the way libraries function. The library is both a set of practices at the forefront of digitisation, and an institution which most stridently resists de-materialisation of civic structure in cities and universities alike. A post-digital library, as mode of artistic enquiry, runs parallel to the capricious enmuddlement of hybridity, and the rhetoric of speculation, to consider the specific implications of digital technology on library cultures, including the various ecosystems that secure its contents. We might affirm, to recall Hayles' previously cited work on 'hyper reading', the post-digital art library as *hyper*-active, rather than simply hybrid, requiring and

32. For an example of the way efficiency is discussed in relation to a post-COVID environment in academic libraries, see: Sonya White, "Spotlight: the hybrid library," SCONUL Annual Statistics 2018-19, accessed August 1, 2023, https://access.sconul.ac.uk/page/sconul-statistics-reports.

33. "Communications and Information Technology enables the integration of information and work. They no longer have to occupy separate spaces... A student's work and information space might include learning objectives, learning tasks, modes of assessment, methods of feedback, and a variety of learning resources, including tutors, laboratories, documents and datasets, and modes of audio, video and textual communication. All of these components are capable of being reproduced electronically..." Richard Heseltine quoted in Rusbridge, "Towards the Hybrid Library".

34. "Family Study Room", University of York, accessed 26 August, 2023, https://www.york.ac.uk/library/visit/family.   **35.** Benjamin Bratton, "The New Normal: Benjamin Bratton on the Language of Hybrids," *ArchDaily*, August 25, 2017, https://www.archdaily.com/878427/the-new-normal-benjamin-bratton-on-the-language-of-hybrids-strelka-institute-moscow.

Torque installation presenting the *Mind, Language Technology* volume in three formats: speed-reading, print and ePub, at *Type Motion*, FACT, Liverpool, 2014.

enacting an epistemological restlessness in the face of the capitalist capture of the bibliotechnical imagination.

Post-digital art as included in this book provides immanent critiques of some concepts inherent in hybridity. Availability and convenience, for example, soon become their other in our own interactive and speed-reader works [p.258], distorting the purpose of users, turning them into trainers. In Joe Devlin's work [p.124], digital preservation also contains a degree of the ghostly, reminding us of the irrational value we place on the aesthetic event a person leaves behind in a book, and a book leaves in them. Rosa Menkman's project of 3D scanning a lifetime of esoteric collections transforms them into a polygon other, frozen in inaccessible virtual space [p.104]. Digitised materials are untouchable and leave some authors somewhat bereft, but contain their own charm, which is captured in the lyrical errors made by speech-to-text in Anna Barham's framed works [p.184].

A post-digital library also becomes the prism by which the services and working methodology of hybridisation can be unpicked: rather than adding digital resources to the library's collection, for example, we might consider how digitisation extracts value from the library's collections and puts additional cognitive pressures on its users [p.44]. Other artists even consider the continuum through which trees and plantlife are integrated into book making and the lives of breathing beings who read them [p.212]. Artists are less burdened possibly by the need for things to be efficient, and more likely to poke fun than spin policy wheels, but that does not make them any less useful. By bringing the digital into play with the library in a more critical, more playful way, artists create space to learn about the technologies involved in the hybridisation of mind, technology and creative practice. As such, *BiblioTech* is a continuation of long-term artistic research we undertake via Torque Editions, which explores our own position in relation to the books we publish.

Torquing the Hybrid Library
Torque Editions started with a book called *Mind, Language, Technology* in 2014.[36] The twisting-frictive relation between the animate matter of the mind, the abstract phenomena of language, and the wires and codes of technology is where the name "torque" came from.[37] All of our projects can be understood

as component acts of an attempt to wring new insight out of these themes and different acts of torsion: these take the form of books, but also events, artworks, commissioning, and discussion. Our events and publications attempt to make transdisciplinary, creative and contemporary research accessible to diverse publics, both general and specialist. *Mind, Language, Technology* included, for example, contributions from individuals supported by learning disability charity Mencap alongside artists, philosophers, and poets. Our second project *The Act of Reading*[38] resulted in a book featuring Alex Leff, a neuroscientist working on the science of reading disabilities, Esther Leslie, a theorist of political aesthetics writing about reading in public, and Hayles discussing her new concept of non-conscious cognition. Similar to the present volume, that book was instigated by a range of activity, including: symposium, exhibition, performance event, workshops, and an installation composed of our first book in a triptych format of ebook, speed reader, and printed form.

BiblioTech – an exhibition in the form of a library
Transforming art galleries into post-digital library spaces, *BiblioTech* toyed with user expectations for the library and the gallery. The majority of works were presented in both gallery locations in Liverpool and Limassol, while some one-off works were exhibited in only one site. Accordingly, this crossover and correspondence created a context to explore modes and limitations, of digitisation and reproducibility in the library context. There were three entry points to the exhibition: the library as a place where things are collected, the library as a space for reading and writing, and the ecosystems and machinic assemblages that support and shape the contemporary library. These three aspects of libraries overlapped within many of the artworks – showing frequently that innovation in the act of collecting produce distinctive shifts in what constitutes the written, and vice versa that reading, writing and bookmaking inform strategies of display and collection. Further catalysing this particular overlap, in Liverpool we constructed special storage and study booths for the artworks. The booths were designed to afford a degree of immersion and separation as study space, but they also operated as display units. In the Liverpool show particularly, we displayed approaches to the special collection using different configurations of screens and books, digital and printed matter, emphasising hybrid contexts and entangled modes of creation and encounter.

In what follows, we describe some of the key works shown in the exhibitions, and the subsequently added texts and visual work in this book, using three headings: **Special Collections**, **Technologies of Reading Writing and Writing Reading**, and **Library Ecologies and Library-making**. Though the Möbius strip and fractal-like nature of the library-book relation makes categorisations somewhat arbitrary, we hope this sequence takes the reader on a

36. Nathan Jones and Sam Skinner (eds.), *Torque #1 – Mind/Language/Technology* (Torque & Link Editions, 2014). Available for download as a free PDF: https://torquetorque.net/publications/mind-language-technology.   **37.** We were also inspired by Timothy Crow's notion of "cerebral torque" which refers to opposing right–left asymmetries of frontal and parieto-occipital regions which he links to both the development of language and schizophrenia. See for example: TJ Crow, "Schizophrenia as the price that homo sapiens pays for language: a resolution of the central paradox in the origin of the species," *Brain Res Rev* (March 2000): 118–129.   **38.** Nathan Jones and Sam Skinner (eds.), *Torque #2 – The Act of Reading* (2015). Available for download at: https://torquetorque.net/publications/the-act-of-reading.

journey into libraries of the past and conceivable future, examines some of the practical implications of 'post-digitality' inside books and other library contents, and subsequently leads outward to the world in which libraries and the books inside them are inevitably embedded. Collectively, the documents in this book suggest a distinctive new mode for libraries: evolving from their central role in shaping book production, and the development of knowledge in society, libraries now behave as thinking-beings themselves – extended mind projects that occupy buildings, networks, and the social sphere in a more active, vibrant and agential way than has historically been the case.

Special Collections

The concept of the special collection is integral to libraries' status historically, particularly within the university, representing a selection of materials at least some of which are considered unique or rare due to their age, subject matter, or value. Special collections libraries are more often themselves composites and microcosms: libraries *of* libraries[39] and libraries within libraries, with their own systems of classification and unique materials. Often the special collection contains items other than books and accordingly they are run by archivists (who prefer not to be called librarians!). In the digital age, the notion of a special collection has evolved to encompass virtual spaces and online archives as well as more conventional books and ephemera. One of the things we tried to do with the *BiblioTech* exhibitions is show how the online and digital space can be used to twist and undo some extant assumptions about institutional collecting, and how collections produce knowledge-making practices. In Liverpool we did some re-presenting of our own: items from cyberneticist Stafford Beer's archive, held at Liverpool John Moores University, were shown in vitrines in a dedicated section of the gallery space where the themes of thinking language and animate mathematics rhymed with the concerns of the artworks we showed.

The overall proposition of the *BiblioTech* exhibitions was that collections, like research practices, cannot be collapsed into default forms, but rather must be understood as situated sites of material and conceptual complexity, where inscription, selection, and computation coexist. Let us now turn to browse items in our collection.

A key example of the way we sought to rethink the role of collection in the shows was our presentation of Animate Assembly (www.animateassembly. org): a project concerned with the relationship between the animate and the inanimate, exploring what kinds of engagements this allows for, and which it disables. Led by Verina Gfader, Anke Hennig, Esther Leslie and Edgar Schmitz, contributors to Animate Assembly are invited to create entries for a speculative glossary of animation that is archived on a website designed by Torque Editions (and coded by our much-missed friend Ralph Mackenzie), augmented with a specially commissioned variable typeface and series of gifs made by Antonio Roberts. For *BiblioTech*, the website was re-imagined as a physical study space with a tablet hosting the website, video showcasing gifs and animations of words

Right: Display of items from The Stafford Beer Collection loaned from Liverpool John Moores University for the *BiblioTech* exhibition at Exhibition Research Lab, Liverpool, 2022.

39. J. Gakobo, "The role of the special collection in the academic library," *International Library Review,* 17, no. 4 (1985): 405–418.

Top Left: Animate Assembly booth at *BiblioTech*, Liverpool with screen-prints by
Caroline Sebilleau and variable typeface visible on screen by Antonio Roberts.
Bottom Left: Rosa Menkman booth artwork, *The BLOB of Impossible Images*,
at *BiblioTech*, Liverpool, 2022.

in the variable typeface, and printed matter by Caroline Sebilleau, comprising screenshots from the website and texts on the development of the project. The project reflects on the idea of collections, both those that self-generate and those existing in virtual spaces, and how they may be assembled, organised, and interacted with. Divorced from the internet as a whole, web-booth installations of this nature perhaps allow for a more focused audience and research experience, but because of the intensive shape/colour dynamics of the project, this particular booth also suggested that aesthetics, desire, even plasticity play a role in producing research environments today.

Above: Installation view of David Gauthier's *List Server Busy* publication and website.
Following pages: Detail of screen-printed Animate Assembly pamphlet by Caroline Sebilleau;
spread from David Gauthier's *List Server Busy* publication; detail of Rosa Menkman's
The BLOB of Impossible Images.
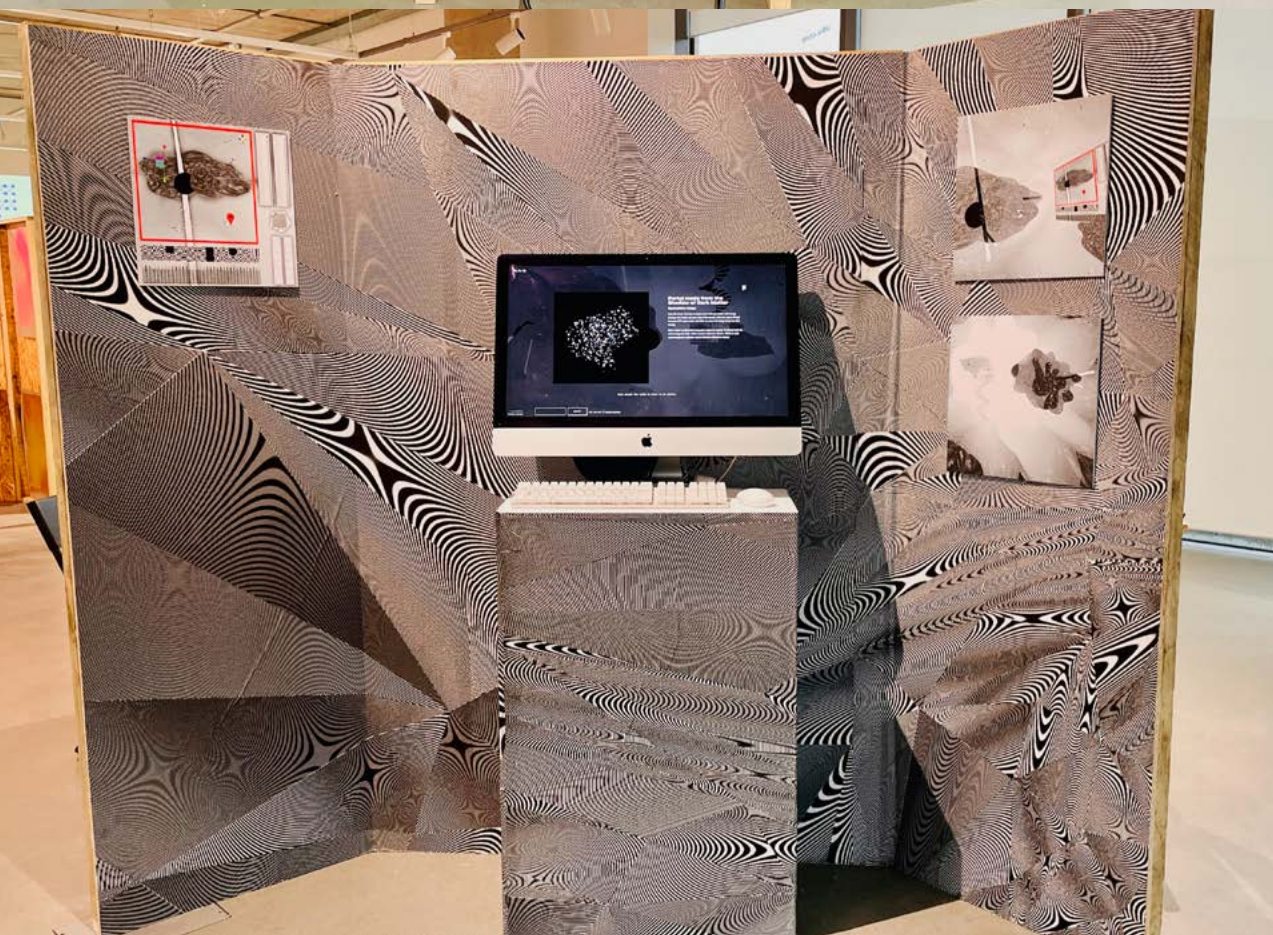
Another online and on-paper work, *List Server Busy. Full Digest Rescheduled* by David Gauthier, comprised a website on a tablet, alongside a very handsome printed edition. The book was essentially written by a piece of software implemented in Python, which combed through email Listserv archives and recomposed their content into chapters. Electronic mailing lists and Listservs were one of the main communication channels of 1990s Pan-European net cultures and the "Net Critique / Netzkritik" that formed out of the post-1989 era as an ideology-aware alternative to the technolibertarian "Californian Ideology". In an ongoing analysis of mailing list archives, David Gauthier generated this mammoth survey volume, summarising data about key net and digital culture mailing lists from the mid-nineties until today. The resulting reports are based on algorithmic operations such as extracting certain years' most-discussed subject threads or most replied to messages. The archives of the lists nettime, Crumb, -empyre-, Spectre, and Syndicate are reactivated in this way, through a transversal analysis of quantitative data and discursive themes

> I understand that computer poetry involves the
> characteristics of the medium in the work,
> and I don't treat separately each text
> generated with the help of a program,
> that would much limit the area of research,
> but I consider the whole
> program and texts as one work, to the degree
> that i include ephemerality and irreproducibility
> in the list of characteristics of computer poetry.
>
> pome works that inspire my criteria:
>
> 1959 When Lutz develops a program on the computer of
> the Technical University in Stuttgart that combined
> 40 words and generates grammatically correct sentences
>
> 1956 Brion Gysin together with the mathematician
> Ian Sommerville permute the words of his poem
> I Am That I Am' with a computer, and
> also in 1961 the poem 'Junk is No Good Baby',
>
> 1964 Jean A. Baudot publishes 'Machine a ecrire',
> the first volume with poems generated on the
> computer, at Les éditions du jour, Montreal
>
> 1965 Emmett Williams permutes on the computer
> the 10 most used words of Dante's Divine Commedia
> [oceal, mondo, terra, dio, maestro, cial, morte,
> dolce, amor] and generates a 213 lines long litany
> of them, and also in 1966 he generated a poem
> with the title 'IBM'
>
> 1967 Baudot'd book inspired Pierre Morelli to
> present with his amateur theater company
> Saltimbanques a theater piece generated on a
> computer. Baudot generated the text on the
> basis of a vocabulary defined by Morelli.
> They presented the piece with the title
> 'Equation pour un homme sensuel' in the
> Pavillion de la Jeunesse in Quebec at the
> Young Theater Festival. It became a scandal.
> After the sixties show the Public Morals Department
> of the Montreal Police accused the piece of
> immorality and they banned the play.
> [it was on stage on a boat in the port of Montreal,
> but out of the Canadian jurisdictional waters,
> to cover the expenses of the process]
>
> 1969 Svante Bodin, member of the Swedish group
> EVKL generated a part of his work 'Transition to
> Majorana Space' with a computer
>
> 1973 Richard W. Bailey edits the first anthology
> of Computer Poems at Protagonistra Press, Michigan,
> USA. The volume included 17 writers from Canada,
> England, and USA, among others Mario Borut,
> Robert Gaskins, Louis T. Millic, Edwin Morgan,
> John Morris, Archie Donald, Norman Oswal,
> Edwin Morgan published already in 1967 in
> Emmett Williams's anthology of Concrete Poetry
> a poem composed on computer from 1963 with the
> title 'jollymerry' [Concrete Poetry, Something
> Else Press, 1967]
>
> 1975
> at the end of the sixties Raymond Queneau and
> François le Lyonnais found OULIPO, and their
> first manifesto states that they plan to use
> computers for research and generating texts.
> later among others Italo Calvino, Georges Perec,
> Jacques Roubaud, Michèle Métail and Harry Mathews
> joined the group. In 1975 Raymond Queneau publishes
> his Cent mille milliards de poemes, and the OULIPO
> presented the program developed for at Europalia
> in Brussels. Readers were able to generate themselves
> variants and print them.
>
> 1973
> In the beginning of the seventies Jean-Pierre Balpe,
> Pierre Lusson and Jacques Roubaud founded the
> literature research group Alamo, that studies and
> generates computer literature. Jacques Roubaud constructed
> numerous literary softwares, the most known
> is 'Alexandrine artificiels', that generates infinite
> number of perfect alexandrin verses. He introduced in
> the computer several thousand words of classic literature,
> but the verses that he generates did not cohere in a poem.
> Roubaud composed together with Pierre Lussonal and
> Paul Braffort the plagiarist generators 'Alexandelaire'
> and 'Mallarm'. Jean-Pierre Balpe is known for the his
> orientation toward literary texts generated on natural
> languages, his most famous generator is 'Poèmes d'amour'
> that generates love libraries and the 1536 poties contes
> partois tristes ou pervers' for which he introduced in the
> computer 420 different structures and several thousand words.
> He published 1536 variants of the tales that he selected
> on the random basis out of the 10 on 45th power possible
> variants.
>
> 1976
> Csaba Tubak launches at the meeting of the avantgarde paper
> magazine Atelier Mongroix [magyar Muhely] in Hadersdorf [Austria]
> his 'Electronic Game and Tool for Writers'. This was a program
> that generated randomly texts from the [2.600 words vocabulary
> and
> texts of the avantgarde poet Alpar Bujdoso. Though the semantic
> and grammatical variants of the generative process were controled
> with algorythm, just as the surrealist poems, these texts could
> not
> be described with criteria of linguistic competence, but with the
> avantgarde view of the literature.
>
> 1985 Tibor Papp presented in the Pompidou Center
> 'les très riches heures de l'ordinateur, n.1' --
> the first dynamic computer generated visual poem
>
> 1989 Philippe Bootz, Jean-Marie Dutey, Frédéric de
> Velez, Claude Maillard, Tibor Papp found and edit Alire,
> a magazine that publishes computer poetry only. It
> appeared twice a year first on floppy, later on CD-ROM,
> in the nineties several magazines started that were
> possible to consult on electronic form only.

> Jean-Pierre Balpe also started the Caen magazine.
>
> and the nineties...
>
> greetings,
>
> anna
>
> Alan Sondheim <sondheim (AT) panix.com>
>
>
>

Date: Mon, 5 May 2003 11:44:17 -0700
From: eclipsis <eclipsis (AT) KEYWEST.COM>
Subject: [mclehard]
To: WRYTING-L (AT) LISTSERV.UTORONTO.CA

(noishard)

(

                    Mahajuq-ahsjoli-Husomnantuseth

                  lb-o/ro?r lilx,p/-kiax me--/:k m\llbu/,-ay
                  qrr/ei,-mbit: al,/uq-whtat f/uh/ gf,l/\-id
                    dilraa-er mitgl/:m,tn-o v\lrykt/-ed
                    pr/l1-b/l/du ja\tsta-p/lped k\o-a/r
                  a/z-thtl (u-.a/l\Y gtum/nio-k\u)

oh

                               (dert/et-tart h,o/ol-ri\p

                                na/be-ramlater ul/-d/

pra\eta\

                                              qa-ea/

eefu,l(k\rehto)-ov prw-\a

mi-er/fs/vsyraup,plek ju-so/\tz

lo-bruz/rin\libl,e do\tor-z/oosi

fr-eti/sl=z ni-hk\lligo\b,folers

bntz,kxth/ev/biv-nu\tcn ha,p-k

imtrm(t-,a]\lo aoh-if\la5tu/dor)

)

Date: Mon, 5 May 2003 10:25:38 -0700
From: <epalmer (AT) JPS.NET>
To: POETICS (AT) LISTSERV.BUFFALO.EDU
Subject: ANY TIME ANY PLACE (excerpt)

Preliminary results of an experiment. [Not to be taken as a finished
work.]
Commentary of any sort is welcome.

0   1   2   3   4   5   6
012345678901234567890123456789012345678901234567890123456789012
345678901

[ASCII-art concrete poem using fragments including: oh, oh AO, AO AN, to leave, for both, her legs, her hand, her lips, her mind, Irish, to plunk, a branch, a strand, the pool, his body, his face, Darrow, Jean, etc.]

[Right-hand pages 777 continue the ASCII-art concrete poems with the same vocabulary fragments: oh AO her AO, to enjoy, John, water until, his body, she kept, her legs, her breasts, and left, to leave, reaching, her lips, the pool, his mind, etc.]

ETC.

To: <webartery (AT) yahoogroups.com>
From: 'Eryk Salvaggio' <eryk (AT) maine.rr.com>
Date: Mon. 5 May 2003 13:17:17 -0400
Subject: Re: trakeshun?

Dukjasbckahhdemh[kdHasss]Akl]Ahl.
sdakajdjkaohiokvdviuvDW67dssaW01
Djahjjaldluss7B9ox7Bbuajbhdjekheh.
Djbsk87B0303Bdaa9DBcvad x,ncn,nc

AsDB9ds89as890css
dejejdiajhd;aB9a7jB97d09s7a097aasd
dsbejdkljalldsla7jahhlj69s7c8997s?

Dakhkul5kajkds097a897dsajdhm.as
asakjykl0B9w7Ovsands.sca,v
ADsedad07d89c7B9svoedhjkjkdHnas
asahjal7Sw0d87skdgfhjqakgdahsjas.
AsjkdslshkdcasB07ds87B97wqhjbncds
askdjajs.

-s.

----- Original Message -----
From: 'Alan Sondheim' <sondheim (AT) panix.com>
To: <webartery (AT) yahoogroups.com>
Sent: Monday, May 05, 2003 12:06 PM
Subject: [webartery] trakeshun?

>
>
> trakeshun?
>
> #//utssssahr/lokeyl-hdO:Dc/packpcdatath
> wnoisie <nthtsh7DO100d->[
> tzssh/wel/vel/q;
> tzssh/oul/wel/q010;
> tzssh/{\UtEsshE-YOU}tzssh[[as010Gat!]}/i7AZZ/g;
> tzssh/Dc[qt]=!'seG0Gout[[as010Gat]]/3OO1/g;
> tzssh/b[:qt}+'seG0Gout[[as010Gat]]/OOP1/g;
> tzssh/N{aqt+\Ut5zshh-YOU}/b1/g;
> tzssh/b[e1+\Ut5zshh-YOU}/b1/g;
> tzssh/NRk{\Ut5zshh-YOU}/8883/g;
> Ptzsh/whe!![/reh1/g;
> Ptzssh/[[as010Gat]]/as010Gat}{se{tzszh}/12/g;
> Ptzsh/[[as010Gat:s]}/se{0Gat]]'as0[Oce]}}/12/g;
> tzssh/och/oenr/g;
> tzssh/{{\Ut5zshE-YOU}+uehl/\Ut5zshE-YOU}}/i\tuohl2/g;
> tzssh/{{\Ut5zshE-YOU}=AN/++\Ut5zshE-YOU/lPaf++2/g;
> tzssh/{{\Ut5zshE-YOU}+tu{\Ut5zshE-YOU}/lu2/g;
> tzssh/{{\Ut5zshE-YOU}+2{\Ut5zshE-YOU}/lu3/g;
> tzssh/{{\Ut5zshE-YOU}+tu{\Ut5zshE-YOU}/1ns3/g;
> tzssh/{{\Ut5zshE-YOU}+ru{\Ut5zshE-YOU}/iRcm2/g010;
> tzssh/{\Ut5zshE-YOU}+NGROT robot
> Thornyornyorryornyornyorornyornyornaxpcnmetm{{\Ut5zshE-YOU}/
> tRORYT robot ThornyornyorryornyornyornyornyornyorvrrsRkuRpcRateat/q;
> tzssh/[[\Ut5zshE-YOU]}+robot
> Thornyornyornyornyornyorrnyocryornyorrnyocryornyocryornyocryn
> tRoRpcdateat[\Ut5zshE-YOU]/isobot ROBOT rooot
> Thornyornyornyornyorn>
> yornyornyornyordTkoRpcdateat2/q010;
> tzssh/{{\Ut5zshE-YOU:]}+[s}o]+{\Ut5zshE-YOU}/14Z/g010;
> tzssh/{\Ut5zshE-YOU}nzssahd-me/lutzssha-me/g;
> tzssh/{\Ut5zshE-YOU}\Ut5zshE-YOU/10KfzshE-YOU/1ns3/g;
> tzssh/utszshe-me{\Ut5zshE-YOU}/s1/g;
> tzssh/Mt5zshE-YOU[\Utzssh5-YOU]/lt/g;
> tzssh/Mt5zshE/uheprintsea! 'shsn/q;
> tzssh/{tts1]OtDna/trsms: 'shsn/q010;
> tzssh/{{\Ut5zshE-YOU}]}+tu{\Ut5zshE-YOU}/1-2/g010;
> tzssh/{{\Ut5zshE-YOU}+{+\Ut5zshE-YOU}/1-2/g010;
> tzssh/{{\Ut5zshE-YOU}]}+ Thornyornyorryornyornyornyornyorn
> tha{{\Ut5zshE-YOU}}/1-2/g010;
> tzssh/{{\Ut5zshE-YOU}+utszshe-maktpcRatea{\Ut5zshE-YOU}}/1-2/
> g010;
> tzssh/{{\Ut5zshE-YOU}}+utsshe-msktesth{\Ut5zshE-YOU}}/1-2/g010;
> tzssh/{{\Ut5zshE-YOU}+]ru{\Ut5zshE-YOU}}/1-2/g010;
> tzssh/{\Ut5zshE-YOU +?/g010;
> tzssh/{\Ut5zshE-YOU}/1l/g;
> tzssh/\OhRfusepsintaaa! 'shsn/q;
> tzssh/slblal/elslel2/g;
> tzssh/tzssh/[*sh]l/lzsshl/g;
> tzssh/tzssh[*IH]{\Utzssh/q010;
> tzssh/-ukeykukeyk/-ukoykkunyku-ukeykukeyk/q;
> tzssh/kel{{010or]]/si/g;
> tzssh/kar/RA1/g010;
> tzssh/RA1/KA1/g010;
> tzssh/tha{as010Geu1]}/ThornyornyorryornyornyornyornyornyorvYor
> n1/g;
> tzssh/Th[[as010Geu!]}/Thornyornyornyornyornyornyornyornrnl/
> g010;
> tzssh/kapse/kapse/g;
> tzssh/k-bsslelel/k-bslelel/g010;

that move across them. The printed volume was presented alongside an online digital index, sending readers back to the original source material.[40] The book was designed and published by Torque Editions, is over 1400 pages in length, bound in Balacron to resemble a legal textbook or bible, and first presented at Transmediale in 2020. By using the tablet and the book together Gauthier emphasises a distinctive (and perhaps very popular) reading technique, where you can search through a dense amount of information online, and then use that to find the page in the book that you want – a form of relationality that is often forgotten in talk of hybrid working.[41] Also, by anthologising and bookifying the Listservs Gauthier performs a kind of eulogy which affirms their historic character, and equally questions their continuing relevance. The book is nonetheless a celebration of the quality of the writing and the exceptional and unique critical engagement found in these early electronic forums, which is deemed worthy of a book!

Rosa Menkman's artwork, *The BLOB of Impossible Images*, is another visually striking example of what a research space could be. She uses the www.newart.city platform, itself a type of 'distributed library', in the form of an anthology of online exhibitions, to produce a virtual space that functions as a special collection. But the BLOB is also an exploration of the limitations of visual manifestation. Menkman's artwork is a digital archive of images that are considered impossible to resolve due to constraints in the affordances of image processing technologies.

What is interesting about Menkman's BLOB is the way it raises questions about the act of collecting as digitisation and datafication, a dialogue between materials and code-representation. In creating an archive of impossible images, Menkman challenges the idea that a collection in the digital context must be limited to what is possible or even tangible, by making impossibility one of the criteria for entry, and draws attention to the hallucinatory qualities of perception and knowledge production itself. Furthermore, Menkman's work foregrounds how the act of sharing and engagement itself aids comprehension, through the creation of new tangents, new tangibilities. She creates a space where the impossible can be celebrated and shared. Combined with a flat-screen experience of a 3D world, the display becomes self-referential, oscillating between being a space of possibility and confinement.

Menkman also presented a more personal take on the act of collecting and digitising at a public talk given during the *BiblioTech* exhibtion at NeMe in Cyprus. As documented in this book [p.104] Menkman has digitised a number of collections of objects she has made since her childhood (feathers, buttons, eggshells) by using a 3D scanning app on her phone. Contextualised within a larger 3D scan she made of The Prelinger Library in San Francisco, the scans of Menkman's own esoteric object gatherings become the site for a discussion of categorisation, permanence and the archival impulse as an autobiographical tool and legacy 'space'.

Other chapters in this section that concern the structure of collections in libraries include Johanna Drucker's essay "How I May Never Know Again" [p.44], a reflection on the dematerialization of library book storage and display throughout her lifetime. Drucker raises intriguing questions about the ability

of digital systems to replicate the experience of browsing well-structured stacks. For her, physical shelving units foster a unique connection between the library building and the user, allowing knowledge to manifest itself, operating effectively as a more dynamic interface than the purely digital. There is of course a generational difference to users preferences, and this is something the truly public library, and readers and writers, must work across to share different experiences and knowledges.

In an essay originally written to introduce his podcast series *Overmorrow's Library*, Federico Campagna builds a rationale for books' conceptual potency that transcends the practicalities of storage and intensifies the aforementioned issue of a generative intergenerational library. Campagna presents a fascinating concept: he envisions a collection of books as an executable encoding of cultural values, capable of ushering in a new civilization "after the apocalypse". These texts offer valuable insights into more deliberate and restrained approaches to collecting and recording, of conservation and embodiment, over digital accessibility perhaps, highlighting the ongoing responsibility to safeguard meaning in an era of seemingly relentless abstraction of language into data by automated technologies.

Similarly in pursuit of the deeper, less knowable potentiality of books and book-like things, we include a text by Joanne Fitzpatrick, who is both a data librarian and a witch. In her chapter for this book, Fitzpatrick looks back at her visit to the *BiblioTech* exhibition and uses the works in it to reflect on the issues around datafication and distribution of art experiences into measurable outcomes. Fascinatingly, her findings lead her to a reconsideration of esoteric 'magick' practices.

An interview with Wafaa Bilal investigates his epic *168:01* project focussed on rebuilding the Baghdad College of Fine Arts library, which was destroyed in 2003. Bilal's work enacts a novel means of exchange: transforming galleries from Taiwan to Chicago, into libraries of blank books which may be bought and in turn funds raised from these sales are used to purchase books from an online wishlist compiled by staff and students at the college in Baghdad. The interview discusses the challenges and broader contexts to *168:01* which functions as a preeminent example of experimental post-digital library-making.

Compounding this scepticism and articulating a deep distrust for the centralised, hierarchical, and inherited power at play within many libraries, Mahdy Abo Bahat's text "Fizzles From the Bleed Marks" mines the act of applying for a Bodleian Libraries Reader card, the promise of knowledge that awaits the reader when crossing into its libraries, and an artistic intervention by Abo Bahat in the Bodleian's Blackwell Hall. This experience is diffracted with that of Abo Bahat's retelling of his friend Redwan's journey from Yemen to the UK as a migrant. Collectively the text and accompanying images tell a cautionary tale regarding how powerful libraries, and equally powerful nation states, pull us toward them, but there are sometimes grave limits to our ability to make ourselves at home within them. Furthermore, what do such centres of power gain from the flow of others, and their life force, to them? How might we say, after Gramsci, do such old institutions preclude the emergence of new more vital forms of life and gathering? Threaded through the text are allusions to the promise all those with a Reader Card must make: "not to bring into the library or kindle therein any fire or flame".

40. David Gauthier, *List Server Busy, Full Digest Rescheduled,* accessed August 1, 2023, https://full-digest-rescheduled.info.   **41.** Described memorably in Hayles, "How We Read: Close, Hyper, Machine".

Technologies of Reading Writing and Writing Reading

Another important aspect of the *BiblioTech* exhibition concerned how new reading and writing technologies are altering our impression of what constitutes a book and thus also the library. The library was produced by the book: the invention of the printing press in the 15th-century led to an explosion in book production and dissemination, which in turn necessitated the development of new more expansive libraries as institutions to house, organise, conserve, and make these materials accessible to readers. As David McKitterick writes in *Print, Manuscript and the Search for Order, 1450–1830,* whilst novel publishing technologies such as the printing press introduce a new level of permanence and reproducibility, very different to manuscripts before them, they also compel interaction and change, within the texts themselves and wider society. Thus, the notes in the margins and the inner monologue at play in a multitude of readers, takes on a new impetus, relevance, and scale, leaking out and gathering into their own published and public forms.[42] Perhaps it is helpful to think of a library's shelves like columns of text, and its walkways and tables like margins in a book; fluidly scaling between one another. Certainly, that is what the computational combination of search engine and content generation often feels like – an idea lampooned in one of the first artworks we chose for *BiblioTech*: *Libraryofbabel.com* by Jonathan Basile.

Libraryofbabel.com is based on "The Library of Babel" short story by Jorge Luis Borges, first published in 1941. This canonical story imagines an enormous library that contains all possible books of every possible combination of letters and punctuation, so that all human knowledge, past, present and future, is theoretically contained in the library's walls. Thought practically in the digital context, Basile's digitalised Library of Babel, uses an algorithm to simulate the library, to circumvent the problem of digital storage which generates a 'book' by iterating permutations of the 26 English letters in the alphabet, space, comma, and period. In so doing, Basile's library could contain every book that ever has been written, and every book that ever could be – "including every play, every song, every scientific paper, every legal decision, every constitution, every piece of scripture, and so on."[43] Within *BiblioTech*, *Libraryofbabel.com* was presented as an interactive website, with videos showing the generative process that produces the words and pages which constitute it. For us, it was important to show the mathematical principles of the Library of Babel, demonstrating that it is the quintessential example of generative literature 'in the making' as well as a permutational space to be explored.

In Borges' story of Babel, despite the enormity of the library, its structure ensures that finding any particular book is impossible. The librarians search tirelessly through the books in the hope of discovering something of value, but they are always disappointed. The online version of such a library is only moderately more manageable, making use of the search function as a generator – the book, page, and shelf of a book containing *any* possible combination of letters is generated each time it is searched for. Users can actually see multiple volumes based on any particular text string – where their searched phrase

Left: Screenshot of search performed on Jonathan Basile's *Libraryofbabel.com*.

42. An update on how annotation is integrated into books is provided in Winnie Soon's essay in this volume on "Computational Publishing". **43.** *Library of Babel,* accessed August 1, 2023, https://libraryofbabel.info/About.html **44.** Ibid.

appears among other randomly permuting letters or among a selection of pages of "anglishised" letter combinations [see example on p.26]. Any text you find in any location of the library will be in the same place in perpetuity. It doesn't simply generate and store books as they are requested – in fact, the storage demands would make that impossible. Every possible permutation of letters is accessible at this very moment in one of the library's books, but crucially is *awaiting* its simultaneous generation and discovery.

Basile understands his online iteration of the Library of Babel as "a place for scholars to do research, for artists and writers to seek inspiration, for anyone with curiosity or a sense of humour to reflect on the weirdness of existence."[44] Indeed, the website itself has a forum where users are encouraged to share strange findings among the variations of letters they generate, and to write about their discoveries "so future generations may benefit from their research". What is quickly apparent, and dryly ironic about the work is of course that any research resulting from a dive into the library would, if written down, also exist in it already. A fitting analogy for a world in which potentially readable publications multiply exponentially, especially in the context of artificial writing agents and which may in the long term rupture the centrality of reading-writing in our culture, in particular within the arts and humanities.

The development of writing technologies, inkwells, typewriters, and word processing software, each link the different modes of reading-writing, transforming the desk and the reading room, and allowing for the production of more written materials, which in turn increase the need for storage and organization of these materials among libraries. Additionally, digital writing technologies have enabled the creation of born-digital documents, which require different preservation and access methods compared to traditional printed materials. As a result, libraries have had to adapt their systems and structures to accommodate these changes in writing technology. One key question we sought to answer with the curation of reading-writing technology-adjacent artworks, was: what might the library need to be, to accommodate the way books are read and written today? But also, how to provide continuity and dialogue with traditional modes of reading-writing as they recede into the past.

One answer exists in the work of Joe Devlin who makes drawings based on the marginal notes made in books [p.124]. He carefully copies marginalia from a single book, overlayed and drawn onto a single page. When we exhibit this work in the context of post-digital publishing and libraries it allows us to think about how, when we digitise texts, we lose more tactile and impulsive human elements, or at least as we used to know and perform them. Librarians do traditionally hate marginalia of course, as it is an act of vandalism in one sense. Devlin is himself a librarian at The University of Manchester and is interested in these aspects of librarianship that escape digitisation. In doing so, perhaps he indicates a new vector for hybridity also – whereby marginalia, in forms such as ebook highlighting and commenting or social media replies, becomes more collective. To return to David McKitterick's work – how might technological acts of stabilisation and mass reproduction compel marginal interaction, fracture and broader change?

In a similar mode, Erica Scourti's work *Clean Sheets* [p.130] are not technically digital, but they express something of the feeling of living among digitised beings. The work is composed of Scourtis diary-entries and other fragmentary reflections written in a Greek-English hybrid on her bedsheets. The piece reflects upon the context of writing into and amongst the digital as

a visually fragmented plane, juxtaposed with the everyday fabric of isolation: the fact that we've always got writing technologies with us compels us to write and compels us to reveal and reflect on ourselves, even (perhaps especially) in our most intimate moments. By "airing her (clean) laundry in public", Scourti produces an interesting dialogue between the private and public aspects of the library too. Exhibiting her work within the gallery, hung fabric with its rippled folds, softened the space, and evoked some of the appliqué community art we saw in the local libraries of our youth. But the context on the sheets, its concerted illegibility in particular, hybridised in the mind with the kinds of uncatalogued messages left for strangers in library toilet stalls and desk undersides too.

The *Post-Digital Publishing Archive 101* by Silvio Lorusso is a collection of books that Lorusso describes as "experimental publishing" which aims "to systematically collect, organise and keep trace of experiences in the fields of art and design that explore the relationships between publishing and digital technology" [p.136]. Quite often these experimental publishing works take advantage of print-on-demand technology, or they work in other kinds of material ways with the limit cases of digitisation. For example, Jack Strange's work *g*, from 2008, is included, where the artist has placed a heavy metal ball on the letter G on a keyboard, causing it to write a document consisting only of **g**.

Also included in the archive, and presented at *BiblioTech*, is Silvio Lorusso and Sebastian Schmieg's *Networked Optimization*. In this work, which resonates with Joe Devlin's marginalia drawings and our own self help book work [p.124]. Lorusso and Schmieg print the ebook *Seven Habits of Highly Effective People* by Stephen Covey using a print-on-demand service, but they only print the quotations or samples that have been highlighted by Kindle users. There has been a suggestion that the sale of self-help books, and romantic literature too, were greatly enabled by Kindle technology, because their coverless character meant people didn't reveal what they were reading. This work is a proposition for a more efficiently readable version: a book that is entirely blank, except sections which lots of people have highlighted as useful using their Kindle interface: including phrases such as "leadership is communicating others worth and potential so clearly that they are inspired to see it in themselves", which was highlighted by 5000 users. The implication is that this is the only useful phrase in the first 20 pages of the book, but we are also reading readers interaction with the text. By combining networked activity and the bespoke potentials of print on demand, we can have both a tactile experience and an efficient one. This is a post-digital practice because it channels the material practice of a printed book back through Kindle technology, and in turn people's networked relationship with one another through print-on-demand services.

Other chapters in this section that concern the act of making books and how they relate to today's library cultures include Winnie Soon's "Computational Publishing", in which they identify a number of innovative publishing processes that make use of digital spaces as collaborative and compositional tools. Soon's emphasis is on the productive tension between the executability of code and the finality of printed matter. Joana Chicau is another coder-artist who reflects on the library via written forms. Her chapter in this book documents a performance

"We are interested in others when they are interested in us."
3.437 highlighters --

Pos. 1070

Anna Barham's *By Heart* workshop at NeMe, Limassol, 2022.

at a *BiblioTech* event in Liverpool, adapting the way a browser displays search results relating to libraries, in a practice she describes as choreographic coding, which animates and exposes the contingent relation between browsers and the "search and find" mechanisms through which we know the internet. And Jacob Reber looks more deeply at Print on Demand (POD) services, connecting the artwork made with them to discourse related to the de- and re-materialisation of the art object. As his essay alludes, the work of collecting, storing, writing and reading books makes the library home to an ecology of material and abstract machines. None of these activities are separable from one another, nor from the larger systems of production, processing, or propositional thinking that arts and 'innovation' spheres do all the time. All of these, of course, rely on functioning worlds to support them.

In another live moment within *BiblioTech*, a workshop called *By Heart* was led by Anna Barham at NeMe in Cyprus. Barham invited users to remember a short reworked text by Vilém Flusser, using a variety of collective and mnemonic techniques. The work asks how verbal information can be inscribed in the body. One cannot help but contrast the difficulty of this act with the largely unnoticed inscription of data into and out of magnetic disks and solid state circuits in digital culture that is the subject of Chicau's iterative project for example. In the end, the workshop participants only managed to remember a short passage of the text:

> if like the mouth like the most recognised like a knife
> tonight ignite mine minds moment cement knives
> mouths feel not to say nothing
> mind feels minefields.

It was a powerful enactment of our reliance on media as mnemonic device and the challenges of collective cognitive labour.

In a neat gesture that thinks through memory as a form of writing, Barham also invited users to consider that learning by heart could be considered a method of publication and distribution, and also how co-learning can become co-authorship. Seen alongside her prints, also reproduced here [p.184], that integrate texts written by the misapprehension of speech-to-text software, Barham's interactive works show how acts of reading, writing, storage and translation are

iterated in the current data-situation (inspiring the human-terfaces neologism we coin in the final chapter of this book). What all the artists we have discussed and who presented their work in *BiblioTech* show, is the intense concentration of value that can be embedded in the act of selective attention, and the potency each cultural act has to reshape us as small-data creatures.

Library Ecologies & Library-making

Library ecologies refer to the complex network of relationships between libraries, their users, and their wider communities, drawing on Matthew Fuller's concept of media ecologies.[45] A library ecology includes not only the physical space of the library but also its digital presence and the social and cultural connections that it fosters. Post-digital library ecologies recognise that digital libraries are not just passive repositories of binarised information but active agents in shaping knowledge production and dissemination in the digital mould. They also recognise the important role that hybridised libraries play in shaping and reflecting the values and priorities of the communities of device and membership-card carriers. One of the challenges for library ecologies is to balance the preservation of traditional library practices with the integration of new digital technologies. Post-digital approaches suggest that libraries should not simply adopt new technologies uncritically; they also critique the over-reliance on automation and digitization in libraries, which can lead to a loss of personal interaction and a narrowing of the range of materials available to users.

A turn to the social means that artists also tend to prioritise community engagement and seek to build partnerships with local organisations and institutions to support broader social and cultural goals. Furthermore, a practice has emerged that we describe as *library-making*, which can be considered to follow the practices of artist printmaking and bookmaking, which combines with the methods of installation and participatory arts, and artists as curators, archivists, community organisers. Sumuyya Khader is an artist of this nature, frequently working with institutions, projects, publishers, social enterprises and artist-led groups. For *BiblioTech*, Khader produced a series of prints that imagine a future library for Black Liverpool history, study and collectivity, reproduced here [p.208]. Displayed in the exhibition in Liverpool, the prints were designed to occupy this future library, anticipating (and willing in to being) its visual language as a combination of historical aesthetics and symbolism. In the gallery, the visual work was presented with a leaflet that encouraged people to submit their own ideas for the *Future Black Liverpool Library*. The project progresses as a dialogue with the artist.

Libraries also connect to ecologies more commonly understood – as natural systems. J.R Carpenter's contribution to this volume voices the presence of a natural entity, the wind, in libraries. She writes through personal experience, guiding the reader on her pursuit of wind, through the libraries and archives that hold records of its effects. She reflects in particular on experiences of the Bodleian Libraries, which Mahdy Abo Bahat's text speaks of also.

Another environmentally-oriented critical work of library-making included in *BiblioTech* was Katie Paterson's *Future Library*: a public artwork located in Oslo, Norway that aims to preserve and present literature for future generations [p.212]. The project involves commissioning one new work of literature each

45. Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (MIT Press, 2005).

year from a leading author, with the twist that none of the works will be read or published until the year 2114. Instead, the manuscripts are kept in a specially designed room in Oslo's Deichman Library and will only be unveiled when the 100-year-long project is complete. The Deichman Library is located alongside a forest, which has been specially planted to provide the paper for the books that will be printed in the future. The project seeks to encourage a long-term perspective on the future, and the role of books and libraries in preserving knowledge and culture. Within *BiblioTech* we showed a film about the *Future Library* project, alongside a pamphlet linked to a locked-away manuscript from one of the authors, Karl Ove Knausgård, and a certificate. The certificates were sold in an edition of 1000 and designed to support the project through the years of its development. Each owner of the certificate (intended to be passed down from generation to generation), is entitled to one copy of the published anthology in 2114.

The *Future Library* project and Khader's *Future Black Liverpool Library* subvert the trend of digitisation and the automation of information, calling attention to the idea that the intangible nature of digital information may lead to the eventual disappearance or occlusion of ecologies on which the library, as we know it, depends. By highlighting the value of physical books and the importance of preserving them among communities of readers and other material beings, these works provide alter-library openings. They suggest the emphasis on the digital in hybrid library practices may prioritise convenience and efficiency at the expense of preserving important cultural and intellectual artifacts for future generations.

Library Stack, a US-based project, examines the concept of library ecologies and library-making from the perspective of post-digital storage. Library Stack view themselves as a "post-custodial" archive, consciously curating a collection of digital objects without ownership or custody of the original materials. Complementing Wafaa Bilal's discussion of his work *168:01* and linking to Johanna Drucker's broadly materialist perspectives with the speculations on libraries as a kind of doomsday-ready civilisation sink, Library Stack's essay [p.248] explores diverse approaches to data storage; delving into the energy consumption, perceived longevity, ecological consequences, and political aspects of each method. The file archive Library Stack keep is entirely online, replicated across different regions of commercial cloud storage. However, the essay discusses the repercussions of adopting an institutional perspective: specifically, the technical and ecological challenges of long-term data storage. The essay summarises their findings and highlights the dangers of projecting too far into the future in a world where the digital is deeply intertwined with physical and biological systems. This insightful discussion encompasses a range of visions from different data storage advocates, spanning those advocating for open, environmentally friendly data futures to eschatological dystopians striving to preserve knowledge for an uncertain future. Significantly, the discussion also emphasises that all hybrid or 'post-digital' libraries will inevitably rely on privatised internet architecture for accessing digital materials. This dependence on privatised systems raises doubts about the authenticity of many libraries' archival claims. The authors challenge the prevailing notion of digital futurity, suggesting that it may even hasten catastrophic outcomes and raising scepticism

46. Alyn Griffiths, "Helsinki Central Library Oodi," *Dezeen,* January 10, 2019, https://www.dezeen.com/2019/01/10/helsinki-central-library-oodi-ala-architects.
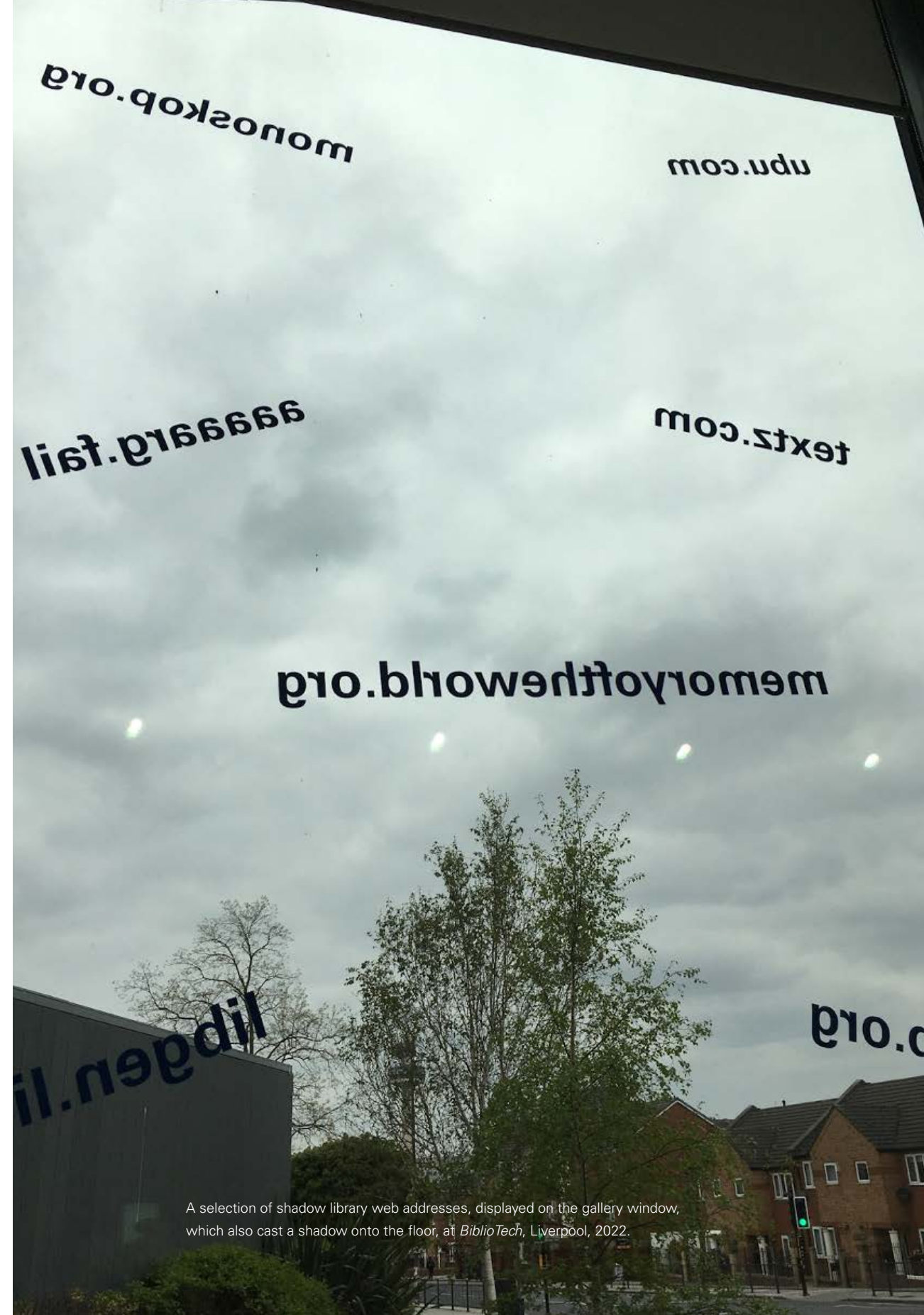
A selection of shadow library web addresses, displayed on the gallery window, which also cast a shadow onto the floor, at *BiblioTech*, Liverpool, 2022.

Joana Chicau presenting at the *BiblioTech* symposium, ERL, Liverpool, 2022.
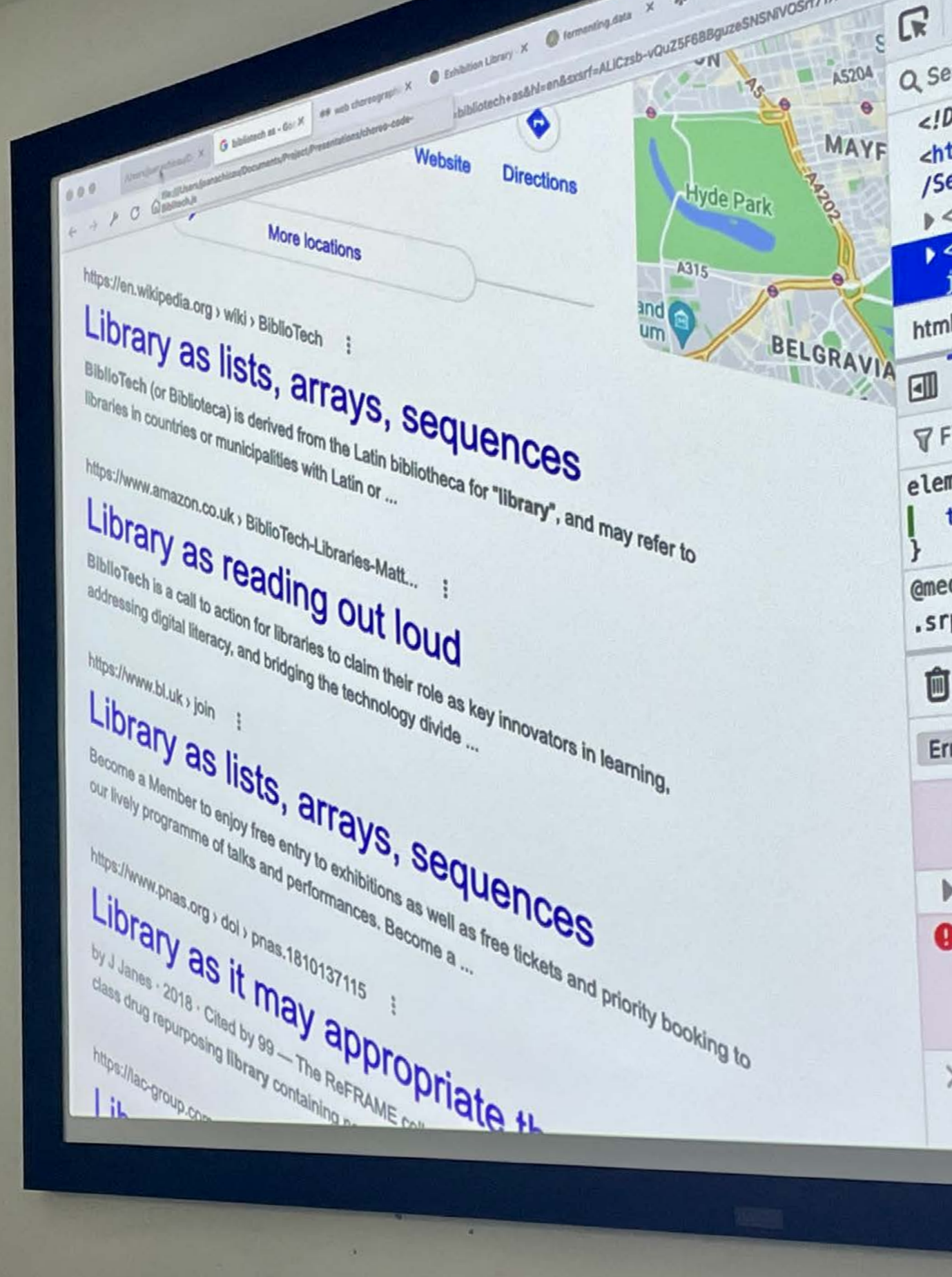
about the very existence of a future library.

Ilari Laamanen's text "In Medias Res" takes us even further into the future and outer space of libraries and books, through his discussion of Jenna Sutela's work *nimiia ïzinibimi*, which attempts to develop a hybrid bacterial-Martian language using AI. Perhaps illustrating a kind of wetware solution to the hardware issues highlighted by Library Stack, this work was commissioned as part of the *Libraries Other Intelligences* project for Helsinki Central Library Oodi which opened in 2018. It is interesting to note that this huge 17,250-square-metre library contains a comparatively small number of books, 100,000 on the upper floor known as "book heaven", with most space dedicated to public amenities such as a cinema, recording studios, a maker space, and areas for hosting exhibitions and events.[46] Sutela's work presented in the *BiblioTech* exhibition took the form of a book that introduces a novel language designed for those without direct access to conventional human languages. Its content draws from *nimiia cétiï*, an ongoing exploration blending machine learning and interspecies communication. It captures the interplay between a neural network, a 19th-century Martian language initially channelled by French medium Hélène Smith, and the behaviours of Bacilli subtilis bacteria, known for their potential survival on Mars and their presence in nattō, a probiotic food. Beyond this microbial-Mars connection, Sutela's project delves into the concept of intelligent machines as creations that function as our intermediaries and infrastructure. At *BiblioTech* we also showed a video designed for Helsinki Library's entrance hall, which visually traced the organic and synthetic elements that birthed this unique work. In the realm of art and innovation, Sutela's *nimiia ïzinibimi* represents a fascinating fusion of technology and biological elements, forging connections between AI, Martian language, and resilient bacteria. This exploration extends into the realm of intelligent machines.

Meanwhile, Torque Editions' own method for making books think using AI [p.258], draws on large, public shadow libraries such as Aaaarg.fail, Memory of the World, and LibGen – projects that illustrate the limitations of traditional libraries in meeting the evolving needs of users in an increasingly digital and data-driven world.[47] Shadow libraries are online platforms where users can upload and download free PDFs and other formats of books, and they exist in a legal grey area. In one sense, they represent a clear and pragmatic democratisation of access to knowledge and raise important questions about the nature of ownership and copyright in publishing-collection circuits. However, the lack of support for these shadow libraries by universities and other institutions suggests that digital content, ownership, and distribution are seen as modes for financialising knowledge, rather than solely enabling it. In lawsuits and in public, publishers argue that the digital books distributed via shadow libraries are provided at the expense of authors and publishers who depend on sales for their livelihoods, while many authors argue that the cost to them is minimal and justifiable, helping them reach more people with their work.[48] This take on shadow libraries emphasises the importance of addressing the extractive practices of the publishing industry and exploring alternative models of distribution that prioritise accessibility and equity over profit, while being cognisant to the complexities of value, intellectual property, labour

47. Joe Karaganis, "The Genesis of Library Genesis: The Birth of a Global Scholarly Shadow Library," in *Shadow Libraries* (MIT Press, 2018): 29–51. **48.** Vincent Larivière et al., (2015). *The Oligopoly of Academic Publishers in the Digital Era. PloS One*, Vol. 10, No. 6 (2015).

and exchange. Indeed, though we have plenty of access to published print and digital books via our institutions, the kinds of accessibility, search, and community librarianship exhibited uniquely in shadow libraries means that we made prodigious use of them when gathering and processing texts for our own machine learning works, as documented in the essay on our RNN triptych [p.258].

The post-digital approach of *BiblioTech*, within the exhibitions and this book, brings to the library a detailed examination of the risks, textures and opportunities related to hybridisation and automation of library cultures. We are specifically concerned with the fate of the academic library. Two of the authors in this book are academic librarians, and for at least half of the authors here, the academic library forms a part of our working week. As such, there is a degree of intimacy in these accounts, critiques, and hackings; a kind of family tension exists between intellectual endeavour and the infrastructure that seeks to support and draw a reason for its own existence from it.

Post-digital art is therefore a mode of auto-criticality in the book, showing that digitisation as a process is not synonymous with the kinds of lossless efficiency commonly attributed to it. Accordingly, the title of the exhibition and this volume suggests the Latin term for library, 'bibliotheca', and alludes to how the library and book culture have become increasingly technologised. This evokes our central consideration: how and what new notions of researching, learning, collecting, and reading-writing in cognitive work are emerging through the library's technologies. But we also present the shadow these technologies cast over deeper, wider, social and natural ecosystems.

Libraries have embraced a novel role in recent years, transforming into active entities resembling sentient beings. They function as extended mind projects, engaging with physical structures, digital networks, and societal realms in a dynamic and vibrant manner – an evolution departing from their historical functions as mere shapers of book production and knowledge development (and back perhaps to pre-historic notions of notation and transportation). The documents within this volume collectively put forth a distinctive vision of this new library paradigm. We hope that this book will inspire further exploration and discussion of these issues in libraries, books and beyond. Hence, in concluding this book, we offer a manifesto-like piece titled "The Post-Digital Perma-Library." It aims to articulate the potential forms of library-network entities that could arise when human users are re-evaluated, albeit with a shift away from their central position as the sole species who do library-making.