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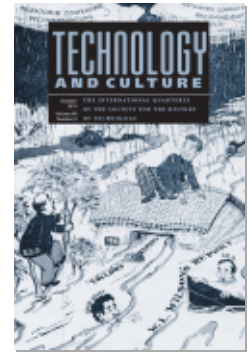
Designing an Internet by David D. Clark (review)

Douglas O'Reagan

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(Review)

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ogy as merely various kinds of *information*, in ways that likely influenced how they understood conflicts over property rights in new domains (such as software or folklore) in the 1960s and 1970s.

At the same time, *Authors and Apparatus* makes an intriguing argument about the sometimes-tense relationship between academic culture and copyright. Scholars of many stripes grew accustomed to receiving free copies of research in the 1950s and 1960s, as freewheeling use of the Xerox machine fueled the mechanisms of academic collaboration, exchange, and (crucially) reputation-building. In the process, scholars became increasingly alienated from commercial justifications for enforcing any scarcity of information—arguably setting the stage for the academic critique of copyright that burst onto the scene in the 1990s.

The greatest strength of *Authors and Apparatus* is the capacious territory it covers, stretching across the Atlantic and encompassing everything from microfilm to magnetic tape to Google. The book offers an elegant entrée into the law of copyright and the history of media, particularly because of its transnational approach, as well as the historical distance made possible by Dommann's choice to close with the 1980s. Sometimes coming to things late can be a good thing.

ALEX SAYF CUMMINGS

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Designing an Internet.

By David D. Clark. Cambridge, MA: MIT Press, 2018. Pp. 432.
Hardcover \$32.95.

Designing an Internet is an excellent, book-long case study in a key theme in the history of technology: the technologies we rely upon might well have evolved along different paths, and thinking through possible futures requires understanding the decisions (and assumptions, and coincidences) that got us to where we are. In *Designing an Internet*, David D. Clark walks readers through how the Internet works, alternate ways an internet might work, and the history that led to one design winning over another.

This is partly a book about history (“The design of the Internet evolved as it was reduced to practice, and its design carries its history in various decisions and the interactions among them” [p. 129]) and it takes an approach that will be familiar to historians and STS scholars (“The Internet is deeply embedded in the larger social, political, and cultural context” [p. 2] and it “does not take the current Internet as a given” [p. 1]), yet Clark is not primarily a historian of technology. Rather, he himself was a key figure in the development of the Internet, and brings a practitioner’s expertise

and deep familiarity with the subject matter. He cites some historical/STS literature, such as Abbate's *Inventing the Internet*, but Clark builds primarily upon his own experience and literature closer to his own fields.

The result, as Clark says upfront, is "a very personal book. It is opinionated, and I write without hesitation in the first person. It is a book-length position paper" (p. 1). It is "a book about how to design an Internet . . . rather than *the Internet*," reviewing both what happened and "what we might have designed back then or might contemplate in the future." Throughout, Clark keeps an admirable focus on the human dimensions of technology—the key role of government, for example, and the political struggles over who gets to develop standards.

The book includes occasional shades of memoir, such as in chapter five, where Clark reprints a paper he wrote in 1988 on "The Design Philosophy of the DARPA Internet Protocols," adding retrospective commentary on his earlier predictions. Historians of technology, then, can approach *Designing an Internet* both as primary and secondary source, and it is a valuable book in both dimensions.

The first three chapters set the groundwork: an introduction, an excellent discussion of the basics of the Internet that is approachable even to less technically-inclined readers, and an overview of key terminology (e.g. Architecture and Design).

Chapter four explores design requirement for an Internet—that is, what key questions needs answers in order to build some sort of an Internet. Most of these are later given their own full chapters. Chapter five is something of a coda, as Clark reprints and comments on his 1998 paper, as discussed above. Chapters six through fourteen each address one key issue at stake in designing an Internet: "Architecture and Function," "Alternative Network Architectures"; "Naming and Addressing"; "Longevity, Security, Availability"; "Economics, Network Management and Control"; and "Meeting the Needs of Society." In each, Clark provides an overview of the issue, usually some historical context for how the current system developed, and an examination of alternatives that have been or could be proposed. The level of technical detail in these chapters could be challenging for someone with no background in the field, though not because of the writing. Clark is admirably clear and straightforward throughout. Finally, chapter fifteen looks ahead at possible futures of the Internet.

While the chapter structure is clear, either the press or author made a questionable decision to format nearly all chapter sub-(sub-sub-) headings identically. This can lead to some confusion. For example, chapter seven's section on the "Performance" of possible alternative network architectures has twenty sub-section headings in about sixteen pages, three of which are "Discussion." Keeping track of implied sub-sections can be a minor distraction avoidable with some minor formatting differences.

In all, *Designing an Internet* is a fascinating, clearly argued book about

the possibilities of network design, helping fuel readers' curiosity about what might have been and might yet be a very different Internet. While it was not written specifically for historians of technology, it will be an important source for any number of research programs, and no doubt its insider's perspective will make it engaging and useful for teaching both undergraduate and graduate students.

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Passwords: Philology, Security, Authentication.

By Brian Lennon. Cambridge, MA: Harvard University Press, 2018.
Pp. 232. Hardcover \$39.95.

This book is ostensibly about the many intersections of the humanities and technology, primarily in the twentieth and twenty-first centuries. In truth, it is a sustained attack on the digital humanities as the latest form of "cryptophilology," Lennon's term for humanities scholarship in service to, or in collusion with, military and national security interests.

In the preface, Lennon observes (p. xvi) that "the historical braid joining modern cryptology as a state security practice with modern philology as its literary other has never completely unraveled." That would have been a marvelous premise for a history of the relationship between technology and the humanities. Unfortunately, Lennon uses it as a platform for delivering a philippic against computational philology and, by extension, the larger field of digital humanities. The thunderous conclusion to one paragraph in particular, makes this clear: "That even after more than a decade of energetic speculation, the phrase and the concept 'digital humanities' still frustrates attempts at provisional definition, let alone precision, is a liability and a predicament for anyone who has come to realize that sustained shouting about novelty only deafens" (pp. xiii–xiv). Nevertheless, Lennon does attempt a provisional definition by equating computational philology, a sub-field of digital humanities, with digital humanities itself throughout his work. Because of their technical and experimental nature, subjects such as stylometry, machine translation, natural language processing, and the like are convenient targets for someone wanting to portray digital humanities in broad strokes as a soulless field populated by gullible and naive nerds incapable of appreciating truth and beauty.

The first full chapter ("Passwords: Philology, Security, Authentication") is a temporary reprieve from Lennon's fulminations against the digital humanities. Here, he presents a thoughtful and sensitive meditation on