lessons are of value, is how the Concilium Bibliographicum in the post-World War II dynamic science environment was simply unready for the researcher who demanded simplicity rather than a full-developed system with intellectual rigor built in to it. Burke's research background in intelligence and geopolitics ensures that his linkage of informational change to the science underpinning *Realpolitik* is astutely made; he describes how the declines of the old "elegant systems" (UDC for instance) occurred and what prompted the rise of newer systems to meet applied needs (such as bibliometrics or scientometrics). These new methods better suited defense research and the larger research universities, both of which had explicit, definable, and potentially intractable information needs that would have been difficult for the likes of Field, Otlet, and La Fontaine to meet.

Ultimately, it was the compradors of science information that were able to fill the gaps in knowledge organization methodology that governments, philanthropists and professional associations could not (or would not) define. While the encyclopedic project, which had long responded to the need for a popular commercial model to sustain its activities now seems moribund, the knowledge organization project which did not and for decades was engaged in recondite inquiry, now has it seems, unlimited potential.

Matthew Kelly
Department of Information Studies
Curtin University, Perth Australia
mattkelly.curtin@gmail.com

Note

1. In the Notes Rudy refers to the increasing inadequacy of the *Poetics* as a sole guide to the laws of epic in the Renaissance. But Aristotle's influence was not entirely spent; Dryden's *Essay of Dramatick Poesie* (1668) relates how a play ought to be "*A just and lively Image of Humane Nature, representing its Passions and Humours, and the Changes of Fortune to which it is subject; for the Delight and Instruction of Mankind" (*§11) *and that the French tendency to follow the advice in the Poetics (unity of action, time and place) allowed for regularity in dramatic construction. This pleased Dryden: "*He so interweaves Truth with probable Fiction, that he puts a pleasing Fallacy upon us; mends the intrigues of Fate, and dispenses with the severity of History, to reward that vertue which has been rendred to us there unfortunate" (§56).

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Indexing it All, which won the 2015 Best Information Science Book from the Association for Information Science and Technology (ASIS&T), frames information, society, and power in the current age of information, highlighting

information as social phenomenon, continuing the discussion from Day's 2001 monograph *The Modern Invention of Information: Discourse, History, and Power*. Day seeks to provide a historically and philosophically grounded discussion of how past and current technological developments influence our understanding of the present state of information in society, and in turn, information science. Day investigates information as a social phenomenon through the lens of various historical "moments" and how these moments in turn shape information. This observed-shapes-the-observer view is most prominent in the discussion of the development of various technologies, exploring documentation pioneer Suzanne Briet's views on the connections between technology and culture.

Day's discussion of moments that have shaped information science are framed through the work of the psychoanalyst Jacques Lacan, Briet, information scientists, and various models that have developed as a result of research directed to fulfilling the information needs of people. His discussion is directed and well thought out; however, it omits ideas, systems, and philosophical influences key to the many areas of information science discussed in *Indexing it All*.

1.0 Introduction

Indexing it All is divided into seven sections plus a preface, acknowledgements, and notes: 1) Introduction; 2) Paul Otlet: Friends and Books for Information Needs; 3) Representing Documents and Persons in Information Systems: Library and Information Science and Citation Indexing Analysis; 4) Social Computing and the Indexing of the Whole; 5) The Document as Subject: Androids; 6) Governing Expression: Social Big Data and Neoliberalism; 7) Conclusion: The Modern Documentary Tradition and the Site and Time of Critique. In the Introduction, Day creates an overview of the development of five cases involving current indexing practices and the history of documentation. *Indexing it All* follows the trend of bringing the focus of modern information science back to early classic authors (Smiraglia 2015), in this case, Otlet, Briet, and Buckland; further, it expands the discussion of information as a social phenomenon, examining information as it was regarded in different historical moments. A pivotal "moment" examined in the book is the evolution and transition from "documentation" to "information science" through a sociocultural exploration of information (45). For example, Otlet hoped to organize all the information in the world (he and Henri La Fontaine eventually developed the Universal Decimal Classification system, which rivals the Dewey Decimal System in much of the Western world), and Briet expanded on Otlet's and La Fontaine's work to examine the connections between technology and society before actor-network theory came to exist in the late twentieth century.

2.0 Books and friends: the early twentieth century

Otlet's early twentieth century views on books and early twentieth-century German philosophers combine with later philosophical stances on libraries, all of which provide a rich discussion of the contrasting philosophies that served to shape library and information science. For example, Otlet viewed books as containers of knowledge as well as friends that satisfy an information need. For a book called *Indexing it All*, however, the discussion of indices was limited. Going back far enough, indexes were created as a tamper-proofing system for cuneiform tablets, but evolved to be what we know as the important abstractions of information used as a surrogate for text. Modern indexes originated from the need to reduce the effort required for searching for information, and expedite information retrieval. Currently, machines are used to augment or replace human indexers, but frequently fall short. Consideration also is given to information overload in this discussion as it relates to information literacy and the individual understanding of information needs, instead of focusing on the sheer quantity of information available and filtering it as a cause of overload.

3.0 Representation

The concept of "aboutness" is examined, introducing the views of Buckland, who describes a trend of returning to the roots of documentation, and in turn, information science. Briet's views of information as a thing, or whatever is informing or is informative are fundamental. The discussion encourages the reader to think about how documents and people can be represented in information systems. Day's discussion of the representation of documents in information systems is further built by the discussion of persons in texts, and how persons can be represented. Day acknowledges that for users to locate items of relevance to them in an information retrieval system, they must compromise their use of language in order to locate information within the indexed system. To me, this speaks too much of the current problems of classification and interdisciplinarity.

Day's overarching discussion of citation as influence over time is insightful and helpful to those unfamiliar with the concept, as it works both forward and backward. This allows the reader to understand the abstraction involved in influence, and helps them understand *why* it is still claimed that we lack a good theory of citation (Cronin, for example, has long stated that information science lacks a theory of citation analysis, cf. Cronin 1984). Con-

sidering Day's discussion of people as something to be represented in chapter three, and his discussion of social computing and big data, it seems natural to assume that the discussion on citation analysis would include the ability of citation analysis to illustrate the intellectual structure of a given set of data.

4.0 Social network analysis theory

Day highlights the progression of information to documents as containers for information. Belkin's (1980) anomalous states of knowledge (ASK) model, which examines the need for information and the ability to fulfill it, is cited, although other models of information retrieval could have contributed other points of view to the discussion. Memes provide a good example of thinking about the Matthew effect in social computing; the notion that "the rich get richer" could be exacerbated by or be an artifact of the system in which a popular object is contained. For example, if popular objects with higher ranks are displayed higher in a list of results in an information retrieval system.

Chapter four continues with Otlet, who hoped to globally organize knowledge. Eventually, Otlet and La Fontaine developed the Universal Decimal Classification. Though based on the *Dewey Decimal Classification*, the UDC contains a larger vocabulary for more specific representation of information objects. Unfortunately, discussion of alternative faceted classification systems and their creators and places in society are not included in this discussion. For example, including a discussion on Ranganathan and his Colon Classification would provide the reader with a broader understanding of indexing and the representation of information objects. Additionally, comparing and contrasting the representation of different examples of information objects as they would be represented by various indexing systems with a discussion of how and why the representations differ would add more value to this narrative.

"Documents" in this context refer to sets of instructions and codes that facilitate meaningful human-machine interaction. Day examines this through Briet's lens, discussing the connections between society and technology, and how technology (once in existence) works to reshape society. Briet holds the distinction of being one of the first scholars to attribute Actor Network Theory to the discussion of technology, though she did not call it that. This discussion could have gone in a number of directions.

5.0 Artificial intelligence and self

Lacan's psychoanalytic lens, especially the mirror stage, is applied to analyzing the recognition of artificial intelligence's (AI) development of self. Lacan's mirror stage can be applied to any moment in an individual's life during which one recognizes oneself through an external object, such as a mirror. It is important to realize that the ego is an object, rather than a subject, in the mirror stage. The corresponding three orders of the real, imaginary, and symbolic easily extend to other frameworks present in philosophy of science, such as Popper's three worlds. When applied to artificial intelligence, the ability of the AI to recognize its "self" as it is present in an external object. Furthermore, recognition of the self as "part of an object" affected by other subjects and objects requires an understanding of the ego alone. Selves are shaped by the social behaviors of others, an acculturation which occurs with exposure.

Robots are, from a social point of view, striving for assimilation into human culture and society much the way books as friends were assimilated. Every type of machine, from physically augmented machines, or machines that have the ability to perform actions on their own, to machines that closely resemble humans are discussed as robots. Robots are subject to closer scrutiny for their behaviors as they increasingly converge on human affect. As such, the closer androids come to matching human affect, the farther away from humans they are deemed to be, as the most human-seeming of them are trapped in the "uncanny valley," the discomfort felt when observing an eerily human-like android (Mori 2012). Androids face the problem of being expected to adhere to social norms. Day argues that the fundamental design of much artificial intelligence research and development is flawed; instead of designing for communication, AI should be designed to justify irrational actions. What can be drawn from this argument (though not explicitly stated) is that when speaking of indexing, as the focus of the book is titled, machine-based means of making classificatory decisions should be based on what could be considered irrational behavior.

6.0 Governing Expression

Finally, Day returns the discussion to how to "read" big data. Sifting through large bodies of self-evident facts on any given subject creates pathways to discovery that were not previously possible. Turning to the issue of social big data, or big data generated by individuals as they move through online interactions, and what it means and what is done with it, Day prompts readers to think about traces they have left in information systems and how their "status as selves is valuable only insofar as they are understood as calculable tendencies and nodes in networks, as threats or allies or sources of profit" (135). The devaluation of individuals in a social system, and overvaluation of tendencies that can be calculated based on remnants in information systems, is under-discussed. A keen

example encountered recently is that of universities gathering data on students through social network profiles that have been linked to students' online course profiles (Rubel and Jones 2014). Those who are interested (companies, governments, etc.) have the ability to gather this individually generated data and examine it in ways that were not previously possible. This readily available data on people and their behaviors creates new sets of risks with regard to privacy as well as safety.

In conclusion, this book is a valuable resource for practitioners of many subspecialties in information. *Indexing it All* succeeds in presenting a larger picture of sociotechnical aspects of information without overwhelming the reader with technical details. Day provokes readers to think about broader sociotechnical issues in information and how they fit in to this question as producers and consumers of data, information, and knowledge.

Laura Ridenour
iSchool at UWM, University of Wisconsin-Milwaukee
ridenour@uwm.edu

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