Information Science Is Neither

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Abstract

Information science is not a science, nor is it primarily about information. In this paper, an argument is developed in support of the latter claim. A working definition of *information* is proposed, and doubts are raised about the extent to which each of five core subfields of information science/studies (information behavior, information retrieval, infometrics, information organization, and information ethics) has to do with information as defined. Several alternative candidates for the primary phenomenon of interest shared by those working in all five subfields are considered: these include data studies; knowledge studies; metadata studies; representation studies; relevance studies; and (as a branch of cultural studies) collection, preservation, and access studies. A prime candidate is identified, and some implications of such a reading for the application of philosophical approaches to information science/studies are highlighted.

Introduction

Information science is not a science, nor, even, is it primarily about information. To assert the former is no longer an especially controversial move. The skeptic might point to the supposed origins of the field in the postwar activities of communications engineers and applied computer scientists—many of whom, following Claude Shannon, understood *information* as a measure of informativeness—and to the indubitable achievements of a "golden age" of retrieval-system design.[1] But not only has it always been difficult to justify fitting under the same heading the work of understanding how people provide access to, search for, judge the value of, and make policy about certain kinds of desired resources, the use of experimental methods in evaluating the utility of technologies and tools has not produced the amount of testable theory one might expect from

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a science (see, for example, Buckland, 2012). Evidence of the declining popularity of "information science" as a disciplinary label may be found in the results produced by searching on that phrase in the Google Ngram Viewer: following a steady rise to a peak in the mid-1980s, annual normalized counts of occurrences of the term in the texts indexed by Google Books drop almost as steadily to a low in 1999 that is equivalent to their early-1970s level and from which they have not risen since.[2]

In contrast, to argue that information science (or even information studies) is *not even about information* is less common, presumably due to such an argument's seeming plainly mistaken, unnecessarily confrontational, and ultimately pointless. Yet, this is the argument I would like to make in this paper.

What does it mean to say whether an area of inquiry is "about" something or not? One understanding of "aboutness" in this context might lead us to assume that area X is about topic Z if and only if a clear majority of the community of scholars who self-identify with area X consider the object of their primary interest to be topic Z. Determining aboutness would then be a straightforwardly empirical matter of surveying the opinions of members of that community.[3] In this paper, however, I take a different approach.

In the next section, I propose a working definition of *information* and discuss how little each of five core subfields of information science/studies (hereafter IS/S) has to do with information, as defined. In a third section, I consider a number of alternative candidates for the primary phenomenon of interest shared by those working in all five subfields. In a fourth section, I take what seems to me to be the prime candidate and highlight some implications of such a reading for the application of philosophical approaches to IS/S; and in a final section, I make a few concluding remarks.

My intention is that the paper be read not so much as a contribution to philosophy of information per se but more as a contribution to the philosophy of IS/S in which the nature and scope of the field are clarified.[4] Does this mean that I am quibbling over semantics? Paying undue attention to labels that do not really matter? My response to this kind of criticism would be that, as much as we might find it distasteful to concern ourselves with matters of academic "branding," it should be clear that no name suggested as the designator of a field is acceptable if it fails to meet the basic criterion of descriptive accuracy: that is, is it interpretable, both by insiders and outsiders—including not just those outside the field, but outside the academy—in a way that leads them, more often than not, to a reasonably accurate understanding of the kinds of things that its scholars do?

Information

It has become a cliché to note that as many definitions of *information* have been suggested as there are writers on the topic. Several other sources do an admirable job of collecting, reviewing, and classifying the full gamut of these suggestions; see, for example, Bates (2010) and Case (2012). Here, I wish simply to present my own version of five such definitions, each of which has—perhaps in variant forms in different contexts—proven acceptable to members of the information science community:

1. *Information-as-data*: Any object, event, or property (or aggregate of such) that takes material form and to which it is possible to ascribe meaning
2. *Information-as-content*: Any abstract class of those material objects, events, or properties that share the same meaning
3. *Information-as-propositional-content*: Any abstract class of those material objects, events, or properties whose shared meaning is a claim about the facts
4. *Information-as-knowledge*: Any abstract class of those material objects, events, or properties whose shared meaning corresponds to the facts
5. *Information-as-news*: Any abstract class of those material objects, events, or properties, the interpretation of which causes change in the set of beliefs held by an interpreter

Clearly, the concept of *meaning* is integral to each of these definitions; this places them squarely in the semiotic tradition of approaches to information studies (see, for example, Warner, 1990). Other schools of thought exist, of course, but I hope that readers who are advocates of those other positions are willing at least to grant that definitions similar to those listed above are among the ones that are most pervasive in IS/S, even if they may not be so in other fields.

How are these definitions applied in practice? Does the answer vary depending on the subfield under consideration? By "subfield," I am referring to those narrower areas of inquiry that are typically counted as branches of IS/S. These include the following: information behavior, information retrieval, infometrics, information organization, and information ethics.[5]

Information in Information Behavior

Scholars of information behavior, it is typically said, study the ways in which people act in relation to information. How do people look for information, and how do they do things to or with it once they have found it? The conception of information that is most characteristic of studies of information behavior is *information-as-data*. Whether or not any given unit of information is ascribed a meaning that is shared, makes a knowledge-claim, corresponds to the facts, or is news to a given person is irrelevant to the basic identification of that unit *as information*—even if the meaning is actually of utmost significance to the interpreter. So long as the people

being studied are interacting with one or more concrete instances of material objects, events, or properties to which it is possible to ascribe meaning or are engaged in activities that are likely to result in such interaction, then their behavior may be counted as information behavior.

This is how it is entirely sensible and appropriate for the field of information behavior to encompass studies of, for example, people looking for YouTube videos or for novels to read. These kinds of items are among those that would not normally be thought of primarily as sources of information in any of the limited senses of information-as-news, -as-knowledge, -as-propositional-content, or even -as-content. It sounds odd to talk about a search for, for instance, a Miley Cyrus video or a library copy of *Gone Girl* as a search *for information*. What one is doing when one is engaged in activities of either of these or related kinds might more accurately be described as looking for entertainment or for a way of spending the upcoming minutes or hours pleasurably. Yet, so long as the field of information behavior is actually concerned with, among other topics, the ways in which people look for things that are construable as information-as-data, then the prospects for an equivalent field of, say, entertainment behavior look rather dim.

Nevertheless, we might well ask why information behavior should survive as a distinct field with that name when the identification of the object of people's activities *as information* seems to be one of its less distinctive features. Is there perhaps another label that might indicate its subject matter simultaneously more precisely and more inclusively?

Information in Information Retrieval

The general field concerned with the design and evaluation of systems that help people to access large collections, and to find within those collections items of interest, has typically been designated *information retrieval* since the coining of the term by Calvin Mooers in 1950. Depending on the context, and in particular on the kinds of items comprising the collections accessed, other labels have been used for particular branches of the general field: "text retrieval," "image retrieval," "video retrieval," "music retrieval," and so on. Since the emergence in the 1990s of the World Wide Web as a massive, publicly accessible collection, both the work involved in designing and implementing web-retrieval systems (search engines) and the activity in which users (searchers) engage have come to be known generically as *search*. Meanwhile, in the digital library community and elsewhere, *resource discovery* has also commonly been used to denote roughly the same area of inquiry.

Running parallel to research in information retrieval, usually understood as focusing on retrieval from collections of relatively unstructured information (namely, narrative text, imagery, sound), has been work on databases, usually interpreted as focusing on retrieval from collections of relatively structured data (numerical and coded data, commonly in the

form of object–attribute–value triples). *Data processing* and *database management* are among the terms that historically have been more commonly used to talk about this kind of more structured data retrieval than they have been applied to less structured information retrieval.[6] Most recently, research into systems for collecting, organizing, and analyzing the "big data" produced by unprecedentedly large-scale projects has been gathered under the heading of *data science*.

We thus have three concepts: 1) the universal set of all kinds of data, structured and unstructured; 2) structured data; and 3) unstructured data. Sometimes the term *data* is used to refer broadly to the first concept, and at other times (for example, in data science) more narrowly to the second one. Sometimes we use *information* to indicate the first concept (that is, when we think of information-as-data), and at other times (for example, in information retrieval) use it more narrowly to indicate the third concept. More typically, however, we use information in one of the senses defined in any variant of the so-called DIKW (data–information–knowledge–wisdom) pyramid, where the class of things called *information* is considered to be a particular subset of the set of things we call *data*: viz., the subset made up of those data that have some defined added value—for example, meaningfulness (information-as-content) or truthfulness (information-as-knowledge). The most significant feature of information as defined in information retrieval is its unstructuredness. In contrast, its "informationhood"—its *being information* in any of the five senses enumerated earlier—is irrelevant to its being considered a desirable object of retrieval.

The possibility that the video for *Wrecking Ball*, Barack Obama's latest tweet, and a photograph of the *Mona Lisa* are all comprised of information has nothing to do with their each being the target of millions of searches. Then why, other than for historical reasons, do we persist in a) characterizing search-engine design as information retrieval, and b) treating it as a branch of information science?

Information in Infometrics

Informetrics may be defined as the study of quantifications of people's information behavior, where information behavior is understood to be a broad category that encompasses authorship, collaboration, citation, and recommending, as well as description, discovery, and use. The distinction commonly made between informetrics and bibliometrics is a subtle one, based as it is on the supposed difference between information (and/or containers/carriers of information) and book-like objects (and/or their content). What does informetrics include that bibliometrics does not? And in virtue of what should informetrics be treated as a branch of information science?

The answers, I would argue, are "nothing"—twice. First, the category of book-like objects is easily extendable so that it includes all entities to

which it is possible to ascribe meaning (all information-as-data). Second, when we locate informetrics in information science, we do so for the same reason that we place information behavior there: we make the assumption that both the human activity we are observing and the field to which we are hoping to contribute are distinctive in virtue of their focus, first and foremost, on what we ordinarily call *information* (that is, information-as-data or information-as-content). But the objects of activities like authorship, collaboration, citation, and recommending are things that we usually characterize as documents, datasets, sources, works, and so on. It would appear that we neither use nor need the concept of information in order to talk about informetrics.

Information in Information Organization

The more common label for the study of the ways in which documents, subjects, and concepts relate to one another—typically with the goal of designing tools like thesauri that can assist searchers in resource discovery—is "knowledge organization" (KO). While that phrase implies that only entities with positive truth-values, such as propositions that correspond to the facts, are the objects of any organizing that might be going on, knowledge per se is not always the raw material of KO projects.

Would it be reasonable to say instead that the bulk of work on KO focuses on the organization of information in any of the other senses listed earlier? Information-as-propositional-content would seem to be most appropriate of those senses to use here, since the nodes and links of any semantic network to which a KO system can be reduced are intended to model concepts (or aggregations of concepts) and the relationships among them—or, to put it another way, to model propositions of the form "concept X relates to concept Y." There would be a certain oddness, however, in the treatment of concepts and propositions as, first and foremost, information; it would be as if we were asserting that the most important shared feature of these entities is their *being information*, their informationhood, rather than, for example, their being entities to which meaning may be ascribed. Whereas, if we were classifying concepts like "Felis," "Felis catus," and so on—or, which is the same thing, if we were constructing a network of the terms we use to name those concepts and the semantic relationships among them or modeling the genus–species relationships linking classes and subclasses of the physical referents of those terms—we would not normally say we were organizing information.

Ordinarily, in KO and related endeavors, we talk about taxonomies, classifications, nomenclatures, terminologies, vocabularies, and ontologies, consisting of terms, names, categories, classes, concepts, signs, and subjects, which, in turn, have extensions and intensions. The discourse here is that of linguistics, semiotics, philosophy of language and logic, metaphysics, and mathematics, and it has little connection to information

science other than what derives from the application of the principles and products of KO to the design of search engines.

Information in Information Ethics

Information ethics is the branch of applied ethics in which ethical theory is brought to bear on the formulation of principles intended to guide the decisions and actions of those who produce, share, describe, look for, use, and otherwise handle information.[7] The study of information ethics overlaps considerably with other branches of applied ethics, such as computer ethics and internet ethics; library, archival, and museum ethics; academic, scientific, and research ethics; and various other incarnations of professional ethics. Any list of issues addressed by information ethics would almost certainly include information privacy and confidentiality, intellectual property, intellectual freedom, and equity of access to information. If we were to remove from the list those issues that are simultaneously covered by cognate fields, what would we be left with?

All four of the listed issues have long been primary concerns of at least one of the related fields—library ethics—on its own, as is made clear in the American Library Association's *Intellectual Freedom Manual* (2010). Issues to do with the ethics of resource selection, resource description, resource discovery, and resource access are also all dealt with by library, archival, and museum ethics in ways that are both appropriate to the institutional context and applicable just as effectively to digital-collections management. The emergence of data ethics as an accompaniment to the rise of data science merely bolsters the argument that the latter is a somewhat opportunistic amalgam of computer, statistical, and information sciences; as such, data ethics treats issues that are common to those fields (and indeed almost every field) and that are already covered well by academic, scientific, and research ethics.

The conclusion to be drawn here, as in the other cases presented above, is that the essence of information ethics is not so much information per se (that is, information as opposed to either nonmeaningful, nonpropositional, nontruthful, or nonnewsworthy data) but rather the question of who should have what kind and level of freedom to publish, select, describe, and access information-as-data—with the emphasis on those particular kinds of activities rather than on activities' objects being any particular kind of objects.

Candidates

Regardless of its status as a science, then, I am suggesting that, in general, information science is not primarily about information. How might we go about salvaging a coherent conception of a productive area of inquiry from its de-informaticized components? And, secondarily, what branch of philosophy is best equipped to supply a conceptual framework for scholarly work in the newly defined field?

Much of the work that gets done in the name of *philosophy of information* has the entirely reasonable goal of conducting a useful analysis of information and related concepts and of the mechanisms by which knowledge of information may be acquired. In philosophy of information, we ask: What sort of thing is information? How is it to be distinguished from data, knowledge, meaning, belief, and so on? If information is to be understood as that which is informative (or as informativeness itself), how are we to determine the absence or presence of informativeness or measure the extent to which something is informative? Philosophy of information has distinguished among families of semiotic, sociocognitive, and mathematical conceptions of information, among others.[8]

Other work in philosophy of information has focused on constructing informational frameworks for the study of traditional branches of philosophy, such as metaphysics, epistemology, and ethics, in which information, and the processes by which it is created and used, take center stage in explanations of the structure of reality, the production of knowledge, the nature of value-judgments, and so on.

Such work would be of great relevance to IS/S—if IS/S were about information. But I am saying that that is not the case. The question remains: If not information, what then? What is IS/S *really* about? A number of candidates present themselves: data; knowledge; metadata; representation, categorization, classification, and conceptualization; instantiation, aboutness, and relevance; collection, preservation, and access; and culture. I am going to consider each one of these in turn.

IS/S as Data Studies

At the time of writing (2014), there seems to be no doubt that both data science and data studies are here to stay as discrete areas of inquiry. Levels of interest in the development and application of tools and techniques for the analysis of unprecedentedly massive quantities of numerical, digital data are high and constantly rising, as are levels of interest in the study of the sociocultural, political, and economic contexts in which data is created and used. From a library and information science (LIS) perspective, one might well express frustration that the LIS community has long been only too aware of both the ephemerality and the interpretability of data, as well as the concomitant need to ensure that all actual and potential users of data have appropriate and effective means of creating, gaining access to, and handling multiple, internally and externally heterogeneous datasets of very large dimensions. Nevertheless, the principles guiding the design of library-user services—already co-opted by information architects and knowledge managers—are being rediscovered and reframed for use by data curators, typically without due academic credit being apportioned for the original formulations. Meanwhile, the information studies community has not been uninterested in noninstrumental analysis of the

contexts and cultures surrounding each stage of the data life-cycle; in practice, data studies is not as new as its practitioners might like to think it is.

In any case, simply to replace one label for information-as-data (*information*) with another (*data*) does nothing to improve the match between the name of the field and the object of study. Just as information science is not primarily about information, neither is data science primarily about data—for reasons of the same kind. The main goal of data science is not to gain a better understanding of the concept of data but to provide specifications of methods that data curators may use to carry out their data-processing tasks efficiently and effectively. A more productive approach might be to determine what features are shared by those tasks and the information-processing activities of professional information scientists.

IS/S as Knowledge Studies

Several other fields could make convincing claims for the terrain implicitly defined by *knowledge studies*: social epistemology, sociology of knowledge, social studies of science, and so on. At different times and in different contexts, conceptions of information have lurched between the two poles of information-as-data and information-as-knowledge. But IS/S has seldom been conceived as the field where philosophers, sociologists, and cognitive scientists (among others) can come together to create mutually acceptable theories of the nature of knowledge and of processes of knowledge acquisition and knowledge transfer as well as methods of knowledge representation and knowledge organization.[9] The area indicated by knowledge studies is far more expansive than that to which information science aspires.

IS/S as Metadata Studies

The concept of *metadata*—that is, propositional data about interpretable resources like documents, records, cultural objects, and numerical datasets—is sometimes invoked as a uniquely primary concern of LIS. Could IS/S really be about metadata? It appears unlikely, if only because the creation and use of metadata are means to an end (or to a variety of ends—not only resource discovery but also access control, inventory control, digital-rights management, and so on), and it would be misleading to name a field with reference to its tools rather than to its raw materials or end products. But that realization is suggestive both of other possibilities, other means to ends, that we should reject for the same reason, as well as yet other possibilities that have somewhat better credentials.

IS/S as Representation, Categorization, Classification, or Concept Studies

I should admit that the argument I originally had in mind when I began writing this paper was that all five of the branches of IS/S considered above—information behavior, information retrieval, informetrics, information organization, and information ethics—have at their core the study

of activities involving the creation and use of descriptive and symbolic representations.[10] Methods of classification and subject indexing and cataloging, which result in the generation of representations of interpretable resources (and of classes of such resources) in the form of metadata, are clearly the central focus of information organization; the primary activity of those whose information behavior is the object of study is their construction of representations of potentially desirable resources; determining the degree of match between members of those two sets of representations (of available resources, and of desirable resources) is the basis for retrieval from collections of resources; information ethics is the study of principles for ethically sound creation and use of representations; and informetrics is the study of the networks of connections among resources that may be identified through analysis of representations.

As may already be obvious, however, a terminological slippage has occurred here. Instead of keeping our eyes on the *activities* of representation, classification, and so on, our attention has drifted to the *results* of those activities—which I have called "representations" here, but I might just as easily and accurately have referred to them as "metadata."[11] There is no escaping the fact that, at least in information science, metadata is the means, not the end. To call information studies "metadata studies" would be rather like referring to the study of painting as the study of paintbrush manufacture.

There is, however, a very real sense in which "representation studies" may still be an appealing umbrella for work that is ostensibly about information but in fact is not. What kinds of things may represent? One plausible answer is that *all* kinds of those things that potentially have some meaning for some interpreter are capable of representing—a specification that is not only very close to, if not equivalent with, *data* but also close to "all kinds of things, period." Certainly, included are concepts and ideas; words, numbers, and other linguistic, logical, and mathematical expressions; documents, texts, and records; pictures and sounds; natural and artifactual objects, events, states of affairs, and their properties; and people and other living or dead organisms.

We may distinguish among three general kinds of representation. Largely separate bodies of literature focus on each of the following: *semiotic representation* (including linguistic and pictorial representation)—the processes by which meanings come to be associated with particular terms, pictures, objects, events, and so on; *cognitive representation*—the processes by which people create mental images of external reality, develop concepts, and learn languages; and *political representation*—the processes by which individual representatives participate in governmental decision-making in place of their constituencies.

It should be obvious that, of these, semiotic representation is the most germane to information studies. Scores of philosophers and lin-

guists, including John Stuart Mill, Gottlob Frege, Charles Sanders Peirce, Bertrand Russell, and Ferdinand de Saussure, have contributed to our understanding of the interaction among the three most commonly identified elements of signs: the signifier (signal, term, stimulus, vehicle); the particular object(s) or event(s) and so on (or classes of such) to which the signifier refers (referent, Bedeutung, extension, denotation, meaning); and the concept(s) signified (sense, Sinn, intension, connotation, meaning); and the three most commonly identified kinds of signs: the *icon*, where the signal physically resembles what it represents; the *index*, where the signal is regularly coincident with, and thus implies points to or serves as evidence of its referent; and the *symbol*, where the signal is associated with its meaning solely as a matter of social convention.

Certainly, the subfield of information/knowledge organization has derived, and continues to derive, considerable benefit and inspiration from semiotics. As a signifier to stand in place of IS/S, however, representation studies does not have the desired intension.

Information Science as Instantiation, Aboutness, or Relevance Studies

Three of the types of relationships between resources that historically have been considered more significant than others are *instantiation* (for example, between a work and one of its copies); *aboutness* (between a work and one of its subjects); and *relevance* (between a work and one of its potential readers). Of the three types, it is relevance that is most often identified as *the key* relationship to be examined in information science, with a centrality that is unmatched by any relation of relevance in other fields. Nevertheless, as important as each of these relationship types is, perhaps especially relevance, to the modeling of retrieval systems, and as interesting as each is from a philosophical point of view, none is of sufficiently broad application to warrant its co-option as a field-defining label.

Information Science as Collection, Preservation, and/or Access Studies

What is more germane to information science than the study of the following: activities by which people look for, recognize, and obtain access to resources like documents, records, cultural objects, and datasets; or activities by which people collect, organize, care for, and keep such resources in order that they may be easily, effectively, and efficiently found, identified, and accessed in the present and in the future?

Considered individually, each of the formulations "collection studies," "preservation studies," and "access studies" is rather vague and ambiguous and not sufficiently all-encompassing to serve as a ready replacement for the current label. It is only when the three terms are brought together that the resulting combination achieves the appropriate level of specificity. But, regardless of any degree of correspondence that it has to the intension earmarked for it, "collection, preservation, and access (CP&A) studies" is obviously a monstrosity. The way forward is not clear. In the

absence of other options, I will refer to CP&A studies in the remainder of the paper, but please note that this is *not* because I am seriously suggesting that anyone should start using this term.

CP&A Studies as a Branch of Cultural Studies

The final possibility that I would like to consider at this point is a conception of CP&A studies as a branch of cultural studies and thereby oriented toward the humanities rather than the social sciences, as is normally IS/S's fate.[12] Concise yet precise characterizations of cultural studies are both rare and divergent, but During's (2005) definition is particularly useful. He sees the field as "the engaged analysis of contemporary cultures," where "engaged" has three different senses:

> First, in the sense that it is not neutral in relation to the exclusions, injustices and prejudices that it observes. It tends to position itself on the side of those to whom social structures offer least, so that here "engaged" means political, critical. Second, it is engaged in that it aims to enhance and celebrate cultural experiences: to communicate enjoyment of a wide variety of cultural forms in part by analysing them and their social underpinnings. And third, and this marks its real difference from other kinds of academic work, it aims to deal with culture as a part of everyday life, without objectifying it. In fact cultural studies aspires to join—to engage in—the world, itself. (p. 1)

I submit that CP&A studies is a branch of cultural studies simply by virtue of the fact that the particular activities with which it is concerned, as defined in the previous section, are *cultural*. They are cultural in the sense that the kinds of activities in which people engage in each dimension of the "resources continuum" vary in accordance with the cultures (institutional, professional, disciplinary, community, social, and so on) that form the contexts for those activities.[13] And CP&A studies is *engaged* to the extent that it seeks to uncover and address social injustice (for example, in the representation of resources to enhance people's experiences of resource discovery and access, whether one's goal in participating in such an experience is, for example, to enjoy a display of cultural-heritage artifacts or learn from a set of astronomical data) and to be part of everyday life—a life in which each of us, shaped by and shaping our own unique contexts, is constantly selecting particular decisions and actions from a large, ever-changing variety of alternatives.

Toward a Philosophy of CP&A Studies

So far, little of this discussion, beyond some basic conceptual analysis, has been in any sense philosophical. In this section, I do not intend to rectify that situation; instead, I would like briefly to advocate for a particular approach to doing philosophy of IS/S—viz., one in which the focus is on collection, preservation, and access as central concepts rather than information.

Does any recognized branch of philosophy exist that maps conveniently onto this proposal or onto one or two of its components? No. But there are several rather isolated contributions to the literature that might be brought together to form the foundation for a project with a broader remit.

Within LIS, interest in collections has sometimes taken the form of an effort to derive a logical definition of *collection* that is useful in the modeling of metadata about resources and the collections into which they are gathered or in the design of collections-management systems that require collection-membership criteria to be specified before resources may be assigned to one collection or another (Heaney, 2000; Lagoze & Fielding, 1998; Wickett, Renear, & Furner, 2011). Other LIS contributions that are said to cover the philosophy of collection development tend to describe particular institutions' collection-development policies or ways in which such policies may be constructed. In philosophy, the concept of collection has been analyzed, and the ontological status of collections defined, directly by Galton (2010) and indirectly (as a group) by Uzquiano (2004) and Effingham (2010), among other metaphysicians. Taking a rather different approach, Cavell (2013) cites Ludwig Wittgenstein and Martin Heidegger in an essay on the philosophy of collecting; other aestheticians occasionally offer their own thoughts on that topic, but, in general, collecting has not been considered an activity worthy of philosophical attention.

Philosophical accounts of preservation include ethical analyses of motivations and justifications for taking action to save endangered species of animals and plants and human languages; to maintain ecological and environmental balances; to protect the natural and cultural heritages and threatened ways of life; and to implement conservative governmental policies. Others invoke concepts of preservation in otherwise very different contexts, such as epistemology (for example, truth or content preservation) and philosophy of mind (memory as the preservation of propositions and images).

In LIS, again, contributions that invoke philosophy of preservation tend to be evaluations of specific archival-appraisal policies and of methods of conservation and restoration. The same is true of LIS authors' use of *philosophy of access*: most of the time, this phrase is used to confer authority on discussions of particular institutions' policies for placing limits on the amount and quality of access that members of certain groups have to certain kinds of resources. While not especially relevant to the current discussion in itself, this usage does point to a potentially more robust and productive conception of philosophy of access—one in which it is assumed from the outset that one of the fundamental goals of CP&A studies is to be engaged, in all three of the senses identified by During (2005), and in particular to advocate for improvements in the amount

and quality of access to resource collections. Here, facets of quality of access include equity, justice, and diversity; and philosophy of access can thereby be reconceived as the study of the ethical value of particular *distributions* of access to collections across populations of actual and potential beneficiaries of the activities of collection and preservation, the *rights* of particular groups to have access, and the *obligations* of particular groups to provide it (see, for example, Mathiesen, 2013). It is no coincidence, of course, that the main concerns of library, archival, and museum studies can be mapped to this conception of philosophy of access with relative ease; that this is not yet so easily said of the main concerns either of IS/S or data science is no motivation to stop efforts to make it so.

Conclusion

To conclude, I submit that the *reason* that information science is not about information is that it is not a science. If it were a science (that is, if we[14] *wanted* it to be a science), then it would be natural for its primary objects of study to be information-as-data and systems of data production, transfer, and use. It would be natural for us to measure amounts of information and rates of data flow, to compute the frequency of occurrence of tokens of different types and plot the distributions of those frequencies, to predict the degree of informativeness of the next batch of bytes to come down the wire. But we do not want it to be (only) a science. In addition to what we learn from measurements and computations, we want to know about ways of eliciting individual persons' requirements and desires for resources of all kinds; about ways of interpreting individual resources so that we can make sensible appraisal decisions and create useful metadata; and about ways of evaluating the extent to which members of specified social and cultural groups are prevented from accessing the resources they want. We want to know about the ways in which individual people construct representations of the natural and cultural world with which they interact, and we want to understand the very nature of representation and interpretation. We want to know how people create new ideas by bringing stuff together in new ways, how people organize stuff for future use, and how people find the stuff they are interested in. We want to know about document and record, about remembering and forgetting, about sensemaking and storytelling, about testimony and ritual, about the practices of everyday life. That we continue to call our inquiries into these topics *information science, studies*, or whatever is a mistake.

Notes

1. For a relatively recent review of developments in the history of conceptions of information science, see Burke (2007), who talks of a "golden age" extending from the 1950s to the '70s, while also recognizing other narratives that locate the origins of information science in the social epistemology conceived by Margaret Egan and Jesse Shera, British research on techniques of classification and statistical analysis of publications, the special

librarianship of the 1920s and '30s in the United States and United Kingdom, the European documentation movement associated with Paul Otlet and later Suzanne Briet, and even nineteenth-century office management.

2. See http://books.google.com/ngrams. One might expect also to see that, in an increasing number of contexts, *information studies* has emerged as a less problematic option; but, again, the rate of usage of this term rose to a peak in 1991, since then the rate has dropped to early-1980s levels. Indeed, the Ngram Viewer's data suggest that *information science* has remained the much more popular term throughout the period from 1960 to the present.
3. This is Chaim Zins's method; see Zins (2007).
4. See, for example, Furner (2010) for an interpretation of the distinction between *philosophy of information* and *philosophy of information studies*.
5. The list of sample topics from past iConferences that are "likely to again draw interest in 2015," for example, includes "information behavior," "information organization," and "information retrieval," as well as "bibliometrics and scholarly communication," "information policy," and "history and philosophy of information," among others. See http://ischools.org/the-iconference.
6. At the same time, the two fields share a large amount of terminology: *query language*, *filtering*, and so on.
7. Floridi's information ethics, in contrast, is a general theory in which ethical issues are viewed from an informational perspective.
8. See, for example, Furner (2010) for a review of work at the intersection of philosophy and information studies.
9. Margaret Egan and Jesse Shera are among the few within LIS to have promoted such a view of their own field; see Furner (2002).
10. The political philosopher Hanna Fenichel Pitkin, building on a taxonomy introduced by A. Phillips Griffiths, distinguishes among four kinds of acts of representation, any combination of which may be exemplified by an individual act (Griffiths, 1960; Pitkin, 1967): *descriptive representation* occurs when a representer-candidate is relevantly and sufficiently similar to the represented; *symbolic representation*, when a representer-candidate stands for, or in place of, the represented; *substantive representation*, when a representer-candidate makes decisions and/or takes actions on behalf of the represented; and *ascriptive representation*, when a representer-candidate is formally authorized to act on behalf of the represented.
11. The term *representation* may be understood in at least three ways. First, it may refer to something that represents (a representer); for example, we might say that the set of metadata used to describe a resource *is* a representation of that resource. Second, representation may refer to the act—carried out by a representer, or representative—of representing the represented (the representee); for example, we might say that a metadata set's act of describing a resource is an act of representation. Third, representation may refer to the act, carried out by a third party or by the represented, of creating a representer, either by making something new that represents or by making some existing thing represent; for example, we might say that a metadata curator's act of creating a metadata set is an act of representation. (Rounding out the set of agent-types involved in representation is the interpreter—that is, the recipient, target, beneficiary, audience, reader, viewer, hearer, or so on—of the act of representing.)
12. I believe, in fact, that information studies can (and should) be reconceptualized so that its close relation to digital humanities is made clear. However, I also believe that the label "digital humanities" is itself misleading, so this part of the argument should probably be saved for another occasion.
13. The notion of a *resources continuum* is derived by analogy from the Australian records-continuum model, for which see, for example, Upward (1996).
14. I mean, I suppose, *I*, not *we*.

References

American Library Association. (2010). *Intellectual freedom manual* (8th ed.). Chicago: Author.

Bates, M. J. (2010). Information. In M. J. Bates & M. N. Maack (Eds.), *Encyclopedia of library and information sciences* (3rd ed., pp. 2347–2360). Boca Raton, FL: CRC Press.

Buckland, M. (2012). What kind of science *can* information science be? *Journal of the American Society for Information Science and Technology, 63*(1), 1–12.
Burke, C. (2007). History of information science. *Annual Review of Information Science and Technology, 41*, 3–53.
Case, D. O. (2012). The concept of information. In *Looking for information: A survey of research on information seeking, needs, and behavior* (3rd ed., pp. 45–76). Bingley, UK: Emerald.
Cavell, S. (2013). The world as things: Collecting thoughts on collecting. In K. M. Moist and D. Banash (Eds.), *Contemporary collecting: Objects, practices, and the fate of things* (pp. 99–130). Lanham, MD: Scarecrow Press.
During, S. (2005). *Cultural studies: A critical introduction.* London: Routledge.
Effingham, N. (2010). The metaphysics of groups. *Philosophical Studies, 149*(2), 251–267.
Furner, J. (2002). Shera's social epistemology recast as psychological bibliology. *Social Epistemology, 16*(1), 5–22.
Furner, J. (2010). Philosophy and information studies. *Annual Review of Information Science and Technology, 44*, 161–200.
Galton, A. (2010). How is a collection related to its members? In B. Smith, R. Mizoguchi, and S. Nakagawa (Eds.), *Interdisciplinary ontology: Vol. 3. Proceedings of the Third Interdisciplinary Ontology Conference* (pp. 9–17). Tokyo: Keio University Press.
Griffiths, A. P. (1960). How can one person represent another? Part I. *Proceedings of the Aristotelian Society, Supplementary Volumes, 34*, 187–208.
Heaney, M. (2000). *An analytic model of collections and their catalogues.* Bath: UK Office for Library and Information Networking.
Lagoze, C., & Fielding, D. (1998). Defining collections in distributed digital libraries. *D-Lib Magazine, 4*(11). Retrieved December 2014, from http://www.dlib.org/dlib/november98/lagoze/11lagoze.html
Mathiesen, K. (2013). The human right to a public library. *Journal of Information Ethics, 22*(1), 60–79.
Pitkin, H. F. (1967). *The concept of representation.* Berkeley: University of California Press.
Upward, F. (1996). Structuring the records continuum, Part 1: Postcustodial principles and properties. *Archives and Manuscripts, 24*(2), 268–285.
Uzquiano, G. (2004). The Supreme Court and the Supreme Court Justices: A metaphysical puzzle. *Noûs, 38*(1), 135–153.
Warner, J. (1990). Semiotics, information science, documents and computers. *Journal of Documentation, 46*(1), 16–32.
Wickett, K. M., Renear, A. H., & Furner, J. (2011). Are collections sets? In A. Grove (Ed.), *ASIST 2011: Proceedings of the seventy-fourth ASIS&T annual meeting, 48.* Retrieved December 2014, from http://onlinelibrary.wiley.com/doi/10.1002/meet.2011.14504801145/abstract
Zins, Chaim. (2007). Conceptions of information science. *Journal of the American Society for Information Science and Technology, 58*(3), 335–350.

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