The Materiality of Knowledge Organization: Epistemology, Metaphors and Society

Joacim Hansson

Linnaeus University, Department of Library and Information Science,
School of Cultural Sciences, 351 95 Växjö (Sweden), <joacim.hansson@lnu.se>

Joacim Hansson is professor of library and information science at Linnaeus University, Växjö Sweden. He has published six books and numerous articles on librarianship and knowledge organization, both in Sweden and internationally.

Hansson, Joacim. **The Materiality of Knowledge Organization: Epistemology, Metaphors and Society.** *Knowledge Organization. 40(6)*, 384-391. 29 references.

ABSTRACT: This article discusses the relation between epistemology, social organization and knowledge organization. Three examples are used to show how this relation has proven to be historically stable: 1) the organization of knowledge in 18th century encyclopedias; 2) the problem of bias in the international introduction of *DDC* in early 20th century libraries in Scandinavia; and 3) the practice of social tagging and folksonomies in contemporary late capitalist society. By using the concept of 'materiality' and the theoretical contribution on the documentality of social objects by Maurizio Ferraris, an understanding of the character of the connection between epistemology and social order in knowledge organization systems is achieved.

Received and accepted 1 September 2013

1.0 Introduction

In his important but largely overlooked essay *Information Criticism: Where Is It?* Jack Andersen makes a simple, but epistemologically important, proposition: "Society is the basic unit of knowledge organization" (Andersen 2008, 102). Anderson (102-103) goes on to demonstrate how this works:

> Social organization GENERATES religion, law, politics, science, economics, education, art, commerce, industry, and administration, which GENERATE documents and information affiliated with institutions that support and maintain social structures, power & influence, which GENERATES produces and distributes, through a variety of genres: books, articles, journals, laws, reports, memorandums, advertisements, newspapers, pamphlets, and different communicative situations, which GENERATE knowledge organization systems.

This perspective on the division of knowledge goes far beyond the traditionally formulated epistemological assumptions in library and information science literature, as found in, for instance, 'classic' knowledge organization theory (Svenonius 2001; 2004) and domain theory (Hjörland 2008). It emphasises the relation between knowledge, power, and division of labor as the foundation of knowledge organization. In its directness, Andersen's statement might feel like a truism, but dismissing it as such may be a mistake, not least looking at today's pervasive information flows and digital document environments. Instead it presents us with interesting challenges for knowledge organization. The reason for this is simply that knowledge can take many forms.

In his deeply influential study *Knowledge: Its Creation, Distribution and Economic Significance* (1982), Fritz Machlup accounts for five general types that can be considered legitimate as the basis of classificatory structures: (1) practical knowledge; (2) intellectual knowledge; (3) small-talk and pastime knowledge; (4) spiritual knowledge; (5) unwanted knowledge. When we consider the history of knowledge organization systems, we find an almost exclusive limitation to the first two categories; practical knowledge and intellectual knowledge. People in general, however, build their lives on various combinations of all five categories of

knowledge, as noted through Machlup's sociological perspective. While confining analytic structures in knowledge organization systems to such limitations, we live in a society (at least in the so called 'developed' countries) where the current form of capitalism has gone so far that it forces us to rethink much of what we have learned being 'true' legitimate knowledge. Furthermore, 'truth' is today connected to 'information,' which, in turn, is increasingly defined by economic value. This development has been—and is—rapid. It triggers a need to question and discuss the value of knowledge organization and its underlying epistemological assumptions. This article is thought to be a part of such a discussion. The main part consists of a discussion around three examples, where social change and ideological preferences have played a significant role in the promotion of new forms of knowledge organization systems. The perspective of the analysis is basically materialistic, in a broad, neo-Marxist sense; relations between social structure, economic power and division of labor govern the way in which claims of epistemological legitimacy for knowledge organization systems are made. Furthermore, such factors ultimately determine which claims actually gain legitimacy (Hansson 2006). For such a perspective, the quote from Andersen is a good start. Before we arrive at the examples, though, we need to initiate a brief discussion on the problem of finding an adequate epistemological position in relation to the organization of knowledge.

2.0 Ontology lost?

Knowledge organization systems normally presupposes some kind of ontology, that there is something 'out there,' independent of individual conscience and experience, that it is possible to know something about and thus to organize. In that sense, most systems are thought to be reproducing some sort of structure, which refers to an equivalent in the world as such. This presupposes a very fundamental assumption; that epistemology is a sort of 'key' with which it is possible to unlock the ontological level of reality, whether natural, social, or spiritual. The fact is that, turning back to Machlup, only two categories of knowledge make ontological claims: intellectual and spiritual. It is also within these that we find struggles of epistemology. As bibliographical classification systems in most cases refer to intellectual knowledge, often in the form of disciplinary divisions in academia (also when it comes to spiritual knowledge; 'religion'), claims and metaphors of scientific knowledge is of interest to discuss. One of the most traditional claims of scientific knowledge is that of 'objectivity,' The notion of objectivity has, however, been heavily challenged now for several decades. If it is not social constructivism (Berger and Luckmann 1966), neo-pragmatism (Rorty 1982), or various standpoint epistemologies (Lennon and Whitford 1994; Trosow 2001), then it is simply a general turn of belief, which proposes that reality only exists in relation to our ability to express it. Such propositions may take form as language games, as in Ludwig Wittgenstein's *Philosophical Investigations* (2009a), where the significance of a terminology is dependent on the context and language use at hand.

What Wittgenstein did was to emphasize that the meaning of language (thus knowledge) is directly related to its potential use. He formulated this idea as an alternative to his own 'picture theory' described in *Tractatus Logico-Philosophicus* (2009b). The picture theory was based on the Aristotelian notion that knowledge categories are objective and that language mirrors knowledge mimetically by reference. The alternative epistemology of *Philosophical Investigations* provided traditional knowledge organization with a whole new set of problems. Elaine Svenonius refers to it as a shift from 'paradigmatic' to 'syntagmatic' relations in the term structures of classification systems and thesauri: "paradigmatic relationships are those that are context-free, definitional, and true in all possible worlds. Syntagmatic relationships are space-time dependent, aposteriori, empirical, synthetic, and often transient" (Svenonius 2004, 583). Thus, syntagmatic relationships emerge as they are formulated and their significance is socially, ideologically, and pragmatically constructed.

Today, the value of social constructivism and postmodern views on science are scrutinized and questioned too. Critique comes from various places, but is most prevalent within philosophy itself. But, as contemporary society tends to move away from a moral and epistemological common ground, thus allowing several forms of knowledge to prevail side by side, is it really reasonable to dismiss constructivism and postmodern relativism? The multitude of legitimate knowledge forms seen today is more or less randomly connected to different document types in digital environments. Is not postmodern (post)epistemology and practice the very essence of late capitalist society? Well, it seems to depend on what we are talking about—it may be so on a day-to-day sociopolitical level, but not necessarily so when it comes to epistemology and its consequences for knowledge organization. As postmodernism denounces ontology as such, and in most cases epistemology too, we face a problem. We need to be able to formulate an ontological level independent of relativistic approach. Such ontology must encapsulate material, social, and ideal objects. One attempt of promoting such an ontology, especially in relation to social objects is presented by the Italian philosopher Maurizio Ferraris in his book *Documentality: Why It Is Necessary To Leave Traces* (2013). Taking the material document as a point of departure, he creates an ontological statement that seemingly bridges the gap between relativism and epistemological

stability, as needed in systems for knowledge organization. What he proposes is that social acts and objects may well have an ontological basis—through the documents that present these acts and objects. He formulates this relation as: social object = inscribed act. Social objects are ontologically 'fixed' by documents, and by organizing these documents, organization of legitimate knowledge becomes possible. In commenting on postmodernism, Ferraris (2013, 80-81) draws up an elementary distinction, ending in a simple enough proposition:

> The dissolutions of facts into interpretations and of the world into texts has not led to the emancipation that Nietzsche and the postmodernists talked about, but rather to populism and authoritarianism. That is the bad news. The good news, however, is that none of it is true. Reality stays where it is and where it has always been, perfectly indifferent to our theoretical wranglings .... What I would like to contrast with dispiriting results is that we have been making much ado about nothing, because reality has not disappeared, being has never been superseded by knowledge and knowledge has never been overcome by will. What I propose therefore is a passage from hermeneutic relativism to realist objectivism.

He does this by ascribing documents a significant position in formulating a realist/materialist position. Documents constitute the very basis of social objects, which are there for us to analyse and understand. This basically brings us back to the introductory proposition by Andersen, that 'society' is the only true basis for knowledge organization. It is an equally document-based formulation of society and social objects. However, what Andersen does that Ferraris does not, is to place the construction of knowledge organization systems as immediate generators of document based social objects. There is room for interpretation, but this room is not unlimited. Reality/society (division of labour, structures of institutions, economic power) is a corrective force, and it is possible for us to attain knowledge of it. Having arrived at this point, we may discuss knowledge organization systems and the kind of social and epistemological relations they present—or are the results of—as inscribed acts. This presupposes that knowledge may be seen as a social object and bringing together Andersen and Ferraris, this seems quite plausible. Having taken this position, it is possible to talk about the 'materiality' of knowledge organization.

3.0 The materiality of knowledge organization

The concept of materiality in regard to knowledge organization refers to a determined way of influence seen in the social production of documents. This production is also the foundation of epistemology, discernible only through the production and dissemination of material documents. I might have followed Ferraris more closely and talked about a 'documentality' of knowledge organization, but I find that a wider notion is more interesting to consider, thus the concept of materiality. It is now time to present three different examples of situations where this is shown; the first highlights the structures of 18th century French and English encyclopedias; the second shows *Dewey Decimal Classification* (*DDC*) in relation to the Swedish library sector; the third puts focus on the development of folksonomies and social tagging in today's digital document environments. The aim of these examples is to shed a light on our present day situation where material, social, and economic conditions trigger change in new ways, which in turn determine how we think of socially legitimate organization of documented knowledge.

3.1 Trees and circles—modern structures of knowledge

With the division of knowledge in *The Advancement of Learning* (1953) through to his *Novum Organum* (1953), Francis Bacon created a fundamental structure that would provide a template for numerous divisions of knowledge in various practical and ideological contexts. As a philosopher, his aim was not to create a pragmatic division of knowledge, but instead to make a representation which could integrate a traditional theocentric worldview with one of empirical science. In its structure, hierarchical and treelike, we see the very bridge between the 'modern' world and that which was before. Indeed, in many ways Bacon himself personalized this bridge through his work. Although the basic tree-structure of Bacon's division of knowledge has remained, his system has been manipulated, distorted, and used in manifestations of epistemological differences.

One of the most well known examples of rewriting Bacon is the *Système Figuré des Connaissances Humaine* by Diderot and D'Alembert from 1751, used as the structuring fundament of their *Encyclopédie*. This is said to be the very definition of the spirit of the Enlightenment. The correspondence between the main categories of knowledge and the faculties of the human mind—history/memory; philosophy/reason; poetry/imagination—which was one of the major novelties of Bacon, is here used in a highly original manner. 18th century encyclopedias were part of a large epistemological redirection. They attempted to fulfill the dream of a comprehensible structure for all human knowledge in forms that would be considered practical for their time. Not only were the categories of knowledge systematized, they were also filled with content (entries), providing an overview not only of the struc-

ture itself, but even more importantly, of what was actually known. It is when this component, the actually known, is added that the structure of knowledge become epistemologically relevant.

Bacon had difficulties fitting the parallel worldviews of his time into one system, leading him to actually construct 'two' trees of knowledge; one structuring 'human learning,' based on the memory/reason/imagination order of categories mentioned above, and one ordering 'divine learning,' split into "the nature of revelation" and "the matter revealed" (Darnton 1984, 212). The former of the divine learning categories contained for example church and doctrinal history, whilst the latter structured moral, positive law, and liturgy, i.e., the practical aspects and consequences of Christian life. To include theology as a subject among others was still a step too bold. Interestingly enough, that step was taken already in 1627 by Gabriel Naudé in his practical *Advis Pour Dresser une Bibliothèque*, where 'religion' was an integral part of the recommended classification for libraries in Paris at that time (Naudé 1963). The inclusion of theology as a part of the tree of knowledge posed no problem for Diderot in the *Encyclopédie*. Instead it is seen as one of the most overt epistemological markers in the system. David Adams (2006) points at the ideological use of the tree metaphor in the *Encyclopédie* and to the subversive nature of both the structure itself and the use of cross-references between entries. Religion is included in the structure under the main category of 'Reason' as 'Knowledge of God,' subdivided as follows:

Knowledge of God
  Natural theology
  Revealed theology
  Knowledge of good and evil spirits
    Divination
    Black Magic

The denouncement of the authority of the church in the prerevolutionary France is here clearly seen, primarily in the position of categories such as 'Black magic' and spirituality close to more doctrinal theology. Adams (2006, 200) concludes: "The way in which religion is handled in the table shows that the divisions of knowledge set out in the Système are not based on any demonstrably cogent or logical principles." The position in the system makes rational empiricism precide also over the metaphysical, theological, and magical. Therefore, as such, the positions are more political than logical.

The fact that most of the epistemological inspiration for the *Encyclopédie* came from across the English canal—Bacon, Newton, Locke—is interesting in that the English support for the ideas of D'Alembert and Diderot was weak. Although Diderot's project was perhaps the largest—and certainly the most influential—there was in England a hoard of encyclopedic projects, commencing with Ephraim Chambers' *Cyclopedia* in 1728. The metaphor underlying the structure in these questioned the tree metaphor, instead giving precedence to the 'circle of knowledge' or 'circle of learning.' Whereas the tree of knowledge formulated a structure of mutually exclusive categories, clearly distinguishing for example art from science and individuals from society, the circle metaphor tended to be more inclusive and holistic, referring to the very etymology of the term 'encyclopedia' as a guide to the circle of knowledge. Julie Hawley (2006, 219) emphasizes this turning back to the original meaning in her analysis of the ideology behind English encylopedias:

> The term encyclopedia connects the alphabetically ordered folios with a richer sense of the circle of learning as something that not only brought together the arts and the sciences, but also united the macro- and microcosmos in a harmonious sphere of divine plentitude.

Interestingly enough, the original and inclusive view on the epistemological character of the knowledge structures in encyclopedias was largely ignored in the succeeding development of practical, bibliographical classification systems emerging in the 19th century. Instead the original Baconian structure prevailed through further manipulation. Machlup acknowledges this as a critical problem, for which one cannot blame Bacon himself: "If anyone is to be reproached, it should be those who have adhered too closely to Bacon's model and have allowed it to endure and dominate the classification systems of higher learning in subsequent centuries" (Machlup 1982, 42). These systems of higher learning have guided the construction of bibliographical classification as well, first and foremost through the use of disciplinary division. Today, the holistic ideal of the circle of knowledge has returned in much knowledge related practice, not least in digital document environments, formal (and informal) learning contexts, and such postmodern knowledge structures as folksonomies and other popular indexing practices. We shall return to these in just a little while. Before that, however, we will turn to our second example, where one specific Baconian adaptation was met with skepticism, although on a less grand scale than in the case of encyclopedias.

3.2 The order of culture: DDC *and Sweden*

In 1921, *Dewey Decimal Classification* (*DDC*) was already a full-fledged international system. Its bias however was explicitly Anglo-Saxon. The structure, mentioned by Dewey as an "inverted Baconian arrangement" (Wiegand 1996,

23), replicated in a rather straight manner the scientific, economic, educational, and industrial ideals of late 19th century USA. Due to this, flaws and inconveniences became apparent as the system was gradually introduced in other countries. In Scandinavian countries, the introduction of *DDC* took place during the first two decades of the 20th century. Strategies varied significantly. In Norway, the system was applied without any major alterations. In Denmark, drastic changes in the hierarchies were undertaken to fit the requirements of the mostly small Danish libraries. In Sweden, the decision was taken in 1921 not to introduce *DDC* at all. Instead, a national classification system, the SAB-system, was constructed, exclusively to fit the practical and ideological needs of Swedish libraries. The main reason was, however, ultimately epistemological (Hansson 1997 and 1999). The Swedish library sector—especially academic libraries—was at that time heavily influenced by Prussian academic culture, thus serving a very different view on knowledge than that which provided the foundation for *DDC*. This was seen, for instance, in that the SAB-system gave more prominence in its tables to what we today speak of as the 'humanities' than did *DDC*. Further, it can be said to have followed the holistic ideals of the British encyclopedias, although no reference was ever made to them—several categories allowed for both scientific, popular, and fictional literature on specific topics, for example in the category of 'hunting and fishing' (Hansson 1999, 181). The reason is partly found in the connection to the Prussian intellectual sphere, but also in the relation between public libraries of Sweden and large popular educational movements, such as the International Organization of Good Templars (IOGT), engaging a huge part of the Swedish population in its work for sobriety and adult education. Movements like IOGT applied a holistic, pragmatic view on knowledge, both in theory and practice. Symptomatically, as the social democratic welfare state has been systematically deconstructed during the last two decades, epistemological, technological, and practical grounds were laid also for the introduction *DDC*. Society as the 'basic unit of knowledge organization' has now changed. As the market economy model of the USA now is being fully implemented in Sweden as well, the epistemological assumptions of *DDC* fit in well. Swedish libraries started, on the initiative from the National Library of Sweden, to implement *DDC* in 2008. In the final report of the *Swedish Dewey Project* from 2013, it is stated that almost all academic libraries have applied *DDC*, but only two public libraries have done so. The reason for this is the ability of the SAB-system to provide a more pragmatic classification which fits public libraries, while *DDC* provides the academic libraries with the accurate tools for working in the international environment of contemporary science communication (Svanberg 2013).

3.3 Dissolving (the old) prescriptives: rhizomes and a new kind of ontology

As information technology has developed during the last few decades, the epistemological relevance of structured hierarchical knowledge organization system has been challenged, both on a practical and epistemological level (Hjørland 2011). Facet classification did not really change anything; it simply made existing enumerative systems more flexible. For example, the introduction of faceted elements in *DDC* increased its capacity to deal with complex subjects, but it did not alter the biased view of society that it presented, nor did it change the emphasis on traditional classification theory, ultimately based on Baconian empiricism and the authority of rational, scientific knowledge.

A major change, both technological and discursive, occurred during and after World War II. As 'information' gradually started to compete with 'knowledge' as the founding concept of knowledge organization and dissemination, a point was reached where the two were treated almost synonymously. As information gained further prominence in society as a whole, quantification and economic value attribution to knowledge and documentation started to determine also qualitative aspects of various systems. Effectiveness in information retrieval systems increased with every new update, and hierarchical classification systems were suddenly no longer considered the most adequate way of organizing information. New computerized information systems were based (in a broad sense) on indexing, and as indexing services improved access to scientific knowledge, it was subjected to critique for creating indexing inconsistencies, such as cognitively biased individual indexers (Frohmann 1992).

This problem was due not only to the individualization of information processes, which is the focus of Frohmann, but also of the development of scientific disciplines, tending towards multi- and cross-disciplinary constructs which were difficult for traditional classification systems to grasp. With the advent of the Internet in the mid-1990s, the idea of indexer subjectivity instead became a stepping-stone of a whole new way of looking at knowledge retrieval and dissemination. Professional and prescriptive indexing practices were seriously challenged even by the very prospects of the Internet. Within the knowledge organization community, discussions emerged on how to meet this development. There was a wish to organize the Internet through further development of existing bibliographical classification systems (Mustafa El Hadi et al. 1998). As it turned out, no one actually asked for that. Instead new forms of knowledge organization practices emerged. Eventually, the practice of social tagging and the construction of folksonomies would prove to have major epistemological implications.

The new element was found outside of the traditional, controlled bibliographic systems. Development of commercial information systems and finally the (real or not) threat to the academic publication industry, Open Access initiatives, proved that control over information and knowledge held an economic value that finally set philosophical considerations aside. By doing so, the loss of epistemology in the construction of knowledge and information systems became apparent. Also, the very concept 'ontology' changed to the meaning we ascribe it today; simply that which is being structured or indexed. Development of the semantic web, or web 2.0, during the last decade has brought tremendous strain on the very idea of ontologically (or at least philosophically) founded knowledge organization systems. Pre-web indexing practices kept a significant element of term control and control of relational structures. Social tagging does not. It is based on a bottom-up inductive structure, where web users provide documents with tags (terms) that can be of a variety of epistemic characters and knowledge forms (scientific, practical, emotional, religious, pastime). More than anything, they reflect the everyday understanding of the web users' experiences in searching and storing documents (textual, commercial, pictorial) for sharing or further use. Robinson and Maguire (2010, 609) suggest that the "Aristotelian structure of information organisation has dissolved, replaced by something more amorphous, if more creative," thus proposing a 'rhizome' metaphor to replace the tree or circle as the best way to represent the documentality and information structure on the web. Even if folksonomies today gain prominence, Dotsika (2009) identifies taxonomies and ontologies as alternatives with a subsequently increasing controlled order of relationships within a given vocabulary. This levelling of organization of information (one hardly speaks of knowledge anymore) contributes to problems of integration that might have occurred earlier too, not least as principles of literary warrant were integrated into ontological claims of knowledge organization systems. Dotsika (2009, 409) summarizes the problem faced in the complex digital document environment of the web:

> While the semantic web creators see the powers of web 2.0 sophisticated data interfaces, collaborative content generation, search and sharing, most web 2.0 enthusiasts know that their collaboratively engineered content fails a platform for automated search, intelligent agents and inter-application integration. As a result there is an increasing number of methods that aim to bring together the bottom-up approach of folksonomies with the traditional top-down design of ontologies.

One such method is seen in the *FolksOntology* strategy by Van Damme et al. (2007), using web-based social communities to enhance and aggregate tagging practices, thus providing a user-generated form of 'ontology' summarizing the collected understanding of term construction of a certain community—be it of a profession (e.g., medicine, psychology, law, librarianship) or a social media community targeting everyday practices and interests (e.g., progrock, home schooling, Gnosticism, long distance running, vegetarianism)—bringing together people of different cultural and sociopolitical contexts. This is something quite different from the ontology in any philosophical understanding of the term, but it corresponds well to the pragmatics of postmodern thought. It seems to have no need of prescriptive classification. Instead abstract, emotional, and spiritual experiences can, in a way traditional classification schemes and indexing systems are unable to, be collected and given a new legitimacy.

It is symptomatic of research on popular indexing practices that the term 'information' sometimes equals 'product,' as in Held et al. (2012). In their study on the relation between social tagging and individual knowledge creation through web navigating processes, they show how significant the individual's preconceived knowledge is. A person with incorrect prior knowledge (e.g., about a medical condition) clearly tends to follow navigation paths that confirm his or her incorrect knowledge. This is an example of the ontological segmentation of digital document environments that we find on today's social web environment. One authority—epistemologically prescriptive classification—has been replaced by another—individualized knowledge claims. Affective reliance on personal experience and prejudice are given epistemological status in the world of the individual.

4.0 Conclusions

It is important to remind us that sociopolitical power structures and class patterns still exist, and they influence the chain of inference illustrated by Andersen in the introduction of this article. The materiality of knowledge organization is intact—turning digital has not changed anything in that respect. As classification upholds the traditional relation between an ontological level of being, epistemological structures, and pragmatic adjustments of these for bibliographical purposes, the fundamental relation between scientific taxonomy and classification attributes the latter a sort of authority, which is both normative and prescriptive. Based on this authority libraries and document collections have been organized in a way that has always been reasonably logic and coherent. This has been possible, as society has acknowledged this order as legitimate. In contemporary digital document environments the rhi-

zome-like flexibility is made possible only in a society where the whole is always and only the sum of its parts. What people feel is true, or at least adequate, 'is' true and adequate. This brings a new role to ontology—all of Machlup's five general types of knowledge are now treated more or less equally on the World Wide Web. The shift from 'knowledge' to 'information' on the Internet has not only changed the meaning of 'ontology'; it has turned knowledge into a product with defined economic value. In this new (dis)order lies a fundamental illusion of the non-prescriptiveness of the semantic web. One might instead claim that one prescriptive authority has been replaced by another. We see it in various social relations, for example, in libraries (user influence on acquisitions), hospitals (patient influence on medical decisions), and universities (student influence on curriculums). Traditional institutional authority is challenged, much based on increased access to information. In the late capitalism we live in today, economic value of documents in a simple Google search govern the pattern of retrieved documents. We see a new Matthew effect—the documents most likely found in a specific search pattern are the ones that give economic revenue, which in turn make them the ones most likely to be retrieved. It is a new kind of epistemology; one that ascribes individual documents a status resembling that analysed by Ferraris. If so, ontology has travelled from being represented by categories to being seen through individual documents of any given kind. Consequences of this still remain to be revealed. In order to understand new and upcoming ways of structuring knowledge, we need further analyses of contemporary productive forces, and to acknowledge them as determinants of systems of currently legitimate knowledge claims. In all, the development of the social web corroborates, in a very clear manner, the proposition that has been with us for the whole of this exposition: society is the basic unit of knowledge organization.

References

Adams, David. 2006. The système figuré des connaissances humaines and the structure of knowledge in the Encyclopédie. In Donald, Diana and O'Gorman, Frank, eds., *Ordering the world in the eigthteenth century*. New York: Pelgrave Macmillan, pp. 190-215.

Andersen, Jack. 2008. Information criticism: where is it? In Lewis, Alison, ed., *Questioning library neutrality: essays from progressive librarian*. Duluth, MN: Library Juice Press, pp. 97-108.

Bacon, Francis. 1953. *Advancement of learning; Novum organum; New atlantis*. Chicago, IL: Encyclopedia Britannica.

Berger, Peter L. and Luckmann, Thomas. 1966. *The social construction of reality: a treatise on the sociology of knowledge*. New York: Anchor Press.

Darnton, Robert. 1984. Philosophers trim the tree of knowledge: the epistemological strategy of the Encyclopédie. In *The great cat massacre: and other episodes in French cultural history*. New York: Basic Books, pp. 191-213.

Dotsika, Fefie. 2009. Uniting formal and informal descriptive power: reconciling ontologies with folksonomies. *International journal of information management* 29: 407-15.

Ferraris, Maurizio. 2013. *Documentality: why it is necessary to leave traces*. New York: Fordham University Press.

Frohmann, Bernd. 1992. The power of images: a discourse analysis of the cognitive viewpoint. *Journal of documentation* 48: 385-386.

Hansson, Joacim. 1997. Why public libraries in Sweden did not choose Dewey. *Knowledge organization* 24: 145-53.

Hansson, Joacim. 1999. *Klassifikation, bibliotek, samhälle: en kritisk hermeneutisk studie av 'Klassifikationssystem för svenska bibliotek'*. Göteborg/Borås: Valfrid.

Hansson, Joacim. 2006. Knowledge organization from an institutional point of view: implications for theoretical and practical development. *Progressive librarian* 27: 31-43.

Hawley, Julie. 2006. 'Encircling the arts and sciences': British encyclopedism after the French revolution. In Donald, Diana and O'Gorman, Frank, eds. *Ordering the world in the eighteenth century*. New York: Pelgrave Macmillan, pp. 216-43.

Held, Christoph, Kimmerle, Joachim and Cress, Ulrike. 2012. Learning by foraging: the impact of individual knowledge and social tags on web navigation processes. *Computers in human behavior* 28: 34-40.

Hjørland, Birger. 2008. What is knowledge organization (KO)? *Knowledge organization* 35: 86-101.

Hjørland, Birger. 2011. Is classification necessary after Google? *Journal of documentation* 68: 299-317.

Lennon, Katherine and Whitford, Margaret. 1994. *Knowing the difference: feminist perspectives in epistemology*. London: Routledge.

Machlup, Fritz. 1982. *Knowledge: its creation, distribution and economic significance, Vol II, the branches of learning*. Princeton, NJ: Princeton University Press.

Mustafa El Hadi, Widad, Maniez, Jacques and Pollitt, Arthur S. 1998. *Structures and relations in knowledge organization: Proceedings of the Fifth International ISKO Conference , 25-29 August 1998, Lille, France*. Advances in knowledge organization 6. Würzburg: Ergon.

Naudé, Gabriel. 1963. *Advis pour dresser une bibliothèque*. Leipzig: VEB édition.

Robinson, Lyn and Maguire, Mike. 2010. The rhizome and the tree: changing metaphors for information organization. *Journal of documentation* 66: 604-13.

Rorty, Richard. 1982. *Consequences of pragmatism: essays 1972-1980*. Minneapolis, MN: University of Minnesota Press.

Svanberg, Magdalena. 2013. *Slutrapport: Deweyprojektet*. Stockholm: National Library of Sweden.

Svenonius, Elaine. 2001. *The intellectual foundation of information organization*. Cambridge, MA: MIT Press.

Svenonius, Elaine. 2004. The epistemological foundations of knowledge representations. *Library trends* 52: 571-87.

Trosow, Samuel. E. 2001. Standpoint epistemology as an alternative methodology for library and information Science. *Library quarterly* 71: 360-382.

Van Damme, Céline, Hepp, Martin and Siorpaes, Katharina, 2007. FolksOntology: an integrated approach for turning folksonomies into ontologies. In *Proceedings of the ESWC 2007 workshop on bridging the gap between Semantic Web and Web 2.0*. Innsbruck, Austria.

Wiegand, Wayne A. 1996. *Irrepressible reformer: a biography of Melvil Dewey*. Chicago, IL: American Library Association.

Wittgenstein, Ludwig. 2009a. *Tractatus logico-philosophicus*. New York: Cosimo Books.

Wittgenstein, Ludwig. 2009b. *Philosophical investigations*. Chichester: Blackwell.