Information Organization and the Philosophy of History

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The philosophy of history can help articulate problems relevant to information organization. One such problem is "aboutness": how do texts relate to the world? In response to this problem, philosophers of history have developed theories of *colligation* describing how authors bind together phenomena under organizing concepts. Drawing upon these ideas, I present a theory of subject analysis that avoids the problematic illusion of an independent "landscape" of subjects. This theory points to a broad vision of the future of information organization and some specific challenges to be met.

Introduction

Of what use is philosophy for organizing information? Philosophers aim to clearly articulate problems and possible solutions to those problems. Insofar as any kind of practice is problem-driven, philosophical investigation of those problems can improve understanding and help guide practice. Philosophy does not provide solutions, but it can help practitioners understand their problems better, and it can potentially help them avoid wasting time on non-solutions.

Furner's (2010) survey of the intersection of philosophy and information studies highlighted several areas of philosophy relevant to and potentially useful for organizing information. Here I focus on an area of philosophy left out of that survey: the philosophy of history. I believe that the philosophy of history is broadly relevant to organizing information. But I have chosen to narrow my focus to a single theoretical idea from the philosophy of history, the idea of *colligation*. The idea of colligation both clarifies the present understanding of, and suggests possible futures for, the practice of organizing information. If my argument is persuasive, I hope that it will lead to further engagements between the theory and practice of information organizing and the philosophy of history.

The philosophy of history is a rich and varied field. It overlaps with other sub-disciplines of philosophy including metaphysics, epistemology, and other meta-disciplinary philosophies such as the philosophy of science and the philosophy of literature. It is also highly interdisciplinary, so much so that some of its most important contributors do not even identify themselves as philosophers, much less philosophers of history (Tucker, 2009). These contributors include philosophically oriented historians who have examined the conceptual underpinnings of their own practice, and literary critics interested in understanding history as a genre of literature.

Rather than attempt to summarize this deep yet fragmented tradition here, I sketch a broad description, before turning to the more specific question of how the idea of colligation is relevant to organizing information. For a general introduction to the field, the article in the *Stanford Encyclopedia of Philosophy* (Little, 2011) is quite good. The articles in Blackwell's *Companion to the Philosophy of History and Historiography* (Tucker, 2009) provide a more in-depth survey of past and current issues in the field. Older anthologies of classic works in the field, including Gardiner's *Theories of History* (1959) and Meyerhoff's *Philosophy of History in Our Time* (1959), can also be useful.

Philosophers of history seek to elucidate the concepts and assumptions implicit in historians' work that usually go unreflected upon by historians themselves. As a systematic examination of historical discourse, philosophy of history is useful for analyzing (the discipline of) history as an information domain (Hjørland & Albrechtsen, 1995). Philosophers of history have examined issues such as how historians turn documents surviving from the past into evidence, how historians make judgments of relevance or significance, the structure and logic of historical explanations, the semantics of historical narrative, the overlap of historiography with the social sciences, the relation of history to cultural memory, and so on. Much of this work is directly relevant to the design and study of organizing systems to support or provide access to historical research, yet few scholars or practitioners of information organizing seem to be aware of it. The exceptions, such as Helen Tibbo in her (1993) work on providing access to historical literature, have demonstrated how the philosophy of history can significantly enrich understanding of the problems of organizing information.

One such problem that has received considerable attention from theorists of information organizing as well as philosophers is the problem of "aboutness." Deciding what a text or other resource is "about" is the central problem of subject analysis. Analytic philosophers have mainly focused on the "aboutness" of individual sentences (Furner, 2010, pp. 183–185), which is not the most useful angle for organizing information. Philosophers of history, on the other hand, are concerned with the "aboutness" of whole texts: "The general problem of how complex texts as a whole may account for some part or aspect of the world, may well be best exemplified by historiography" (Ankersmit, 2009, p. 201). This problem is the focus of the theory of colligation and colligatory concepts.

Colligatory Concepts

Colligatory concepts are concepts explicitly constructed by historians. Historians traditionally construct colligatory concepts by writing texts, but complex images, documentary films, museum exhibits, and simulated reenactments can also serve as vehicles for colligation. By reading texts, watching films, attending exhibits, and so on we develop understandings of concepts with names such as *Napoleon*, *capitalism*, or *Second Gilded Age*. These concepts are colligatory concepts.

The intellectual historian Daniel Rodgers' recent book *Age of Fracture* (2011) provides an excellent example:

> Across the multiple fronts of ideational battle, from the speeches of presidents to books of social and cultural theory, conceptions of human nature that in the post-World War II era had been thick with context, social circumstance, institutions, and history gave way to conceptions of human nature that stressed choice, agency, performance, and desire. Strong metaphors of society were supplanted by weaker ones. Imagined collectivities shrank; notions of structure and power thinned out. Viewed by its acts of mind, the last quarter of the century was an era of disaggregation, a great age of fracture. (p. 3)

Rodger's book presents an aspect of the last quarter of the twentieth century in the United States: its "acts of mind." It portrays these acts of mind by constructing a colligatory concept, to which Rodgers gives the name *age of fracture*. The meaning of that phrase is proposed by the entire text of Rodger's book. The book pulls together an array of ideas and events and represents them as a unified whole. This whole is the colligatory concept Rodgers constructed.

The notion of colligation was borrowed from the philosopher of science William Whewell (1858, p. 73) and introduced to the philosophy of history by William Henry Walsh. Walsh wanted to describe how historians discern unities in a morass of past events. He argued that historians *colligate*—bind together—individual events under "appropriate conceptions" to which they give names like *Industrial Revolution* and *Enlightenment* (Walsh, 1942). Several such colligatory concepts may be related to one another by the historian, who then writes a narrative of the events that is organized by means of these concepts and their interrelations.

Colligatory concepts make the past understandable. Walsh (1942) believed that this is because colligatory concepts refer to objectively existing past "thoughts" or "policies" (pp. 131–132). The historian recognizes that the same thought or policy lies behind some set of events, and by grouping them under a colligatory concept traces an intrinsic pattern of relations among them (Walsh, 1951, p. 59). Colligatory concepts thus reflect or refer to past reality as discovered by the historian, and they make the past understandable much as a scientist's discovery of an underlying law supposedly makes nature understandable.

Walsh's account belongs to a Western tradition, leading back to Aristotle, of treating concepts as mirroring a separate reality of things or events (Marradi, 2012). But this account was actually a departure from Whewell's original definition of colligation. Whewell wanted to explain how scientists develop general theories from specific observations. He believed that empirical observations alone could not produce new theories. To produce a theory that can explain observations, the scientist must first conceptualize the observations in a certain way: he must propose a certain point of view from which to regard the observations. This point of view, Whewell argued, originates not in the things the scientist observes, but in his mind.

The historian Henri-Irénée (1954/1966) translated Whewell's point to the historical domain when he wrote that "To know (in this case, to know historically) is to substitute a system of concepts *elaborated by the mind* for the raw event itself" (p. 155, emphasis mine). Here "elaboration" is used in its original sense of crafting or creating. William Dray (1959) likewise defined colligation as a summative or metaphorical generalization that arranges past events into a pattern. Such a generalization is the historian's *proposal*—not *discovery*—of what those events "amount to" (p. 406). Dray's definition is close to Whewell's original notion of the colligatory concept as something imposed upon data by a mind, rather than an intrinsic pattern discovered in the data. But where Whewell considered colligation to be a necessary first step toward explanation by laws, Dray argued that colligation was a distinct form of historical explanation, separate from scientific approach to explanation.

Louis Mink (1966) also contrasted historical understanding with scientific explanation, arguing that history should be viewed as an autonomous mode of inquiry rather than an immature science. He viewed colligation as an interpretive act in which one moves from seeing that a series of events happened to seeing those events as a synthetic whole. Mink called this interpretive act *synoptic judgment*. Like Whewell, Mink was careful to stress that synoptic judgment is not simply the bringing together of events, but the act of judgment or conceptualization that enables one to see those events as particular kinds of facts. Mink also emphasized that synoptic judgment is not only something that the historian exercises during her research process, but that inducing this judgment or "seeing as" in her audience is the aim of the historical text. This insight closes the loop between Walsh's separate steps of colligation and narration, and makes it clear that *colligation* refers to both the process by which a historian develops a historical understanding of some complex of events *and* the techniques by which she communicates that understanding to others.

In contrast, C. Behan McCullagh (1978) returned to Walsh's "empirical" definition of colligation by proposing that colligatory concepts can be differentiated into *dispositional* and *formal* categories. Dispositional colligatory concepts are those that group past events based on some shared set of ideas or attitudes (echoing Walsh's "thoughts or policies"). For example, one might point to a shared set of liberal and radical ideas as the basis for arguing that the civil rights movement stretched from the 1930s to the 1970s (Hall, 2005). Formal colligatory concepts, on the other hand, present processes of historical change as having a particular form. To present some process of change as sudden and intense, for example, historians will use the word *revolution*.

McCullagh (1978) claimed that "quite often historians know the form of a change but are uncertain about the reasons for it. *Having confirmed that a revolution has occurred*, they then debate the reasons why" (p. 272, emphasis mine). This claim betrays a misunderstanding of colligation. There is no well-accepted form or template to which historians can compare a phenomenon to determine whether *revolution* is the correct word to use.[1] To use the word *revolution* is to portray a portion of the past a certain way. That portrait may include "reasons why" or the postulated presence or absence of shared dispositions. Dispositional and formal aspects are not so easily separable.

McCullagh's claim reveals a deeper issue than that, however. McCullagh assumed that words like *revolution* and *feudalism* name things that historians can "discover" in the historical evidence. For example, he stated that "feudalism has been discovered, not only in Europe, but also in Japan" (McCullagh, 1978, p. 273). No doubt a word like *feudalism* has a certain nimbus of meaning, but that is not sufficient for it to pick out a single concept that different historians can independently identify as applicable to different times and places. Colligatory concepts are the products of individual historians, and each is unique, though they may share a name (Ankersmit, 1983, p. 92). As Marc Bloch (1953) wrote:

> What of the "feudalisms" throughout the world from China to the Greece of the beautifully greaved Achæans? For the most part, they bear scarcely any resemblance to each other. That is because nearly every historian understands the word as he pleases. (pp. 175–176)

A historian writing a history of the Zhou Dynasty may use the word *feudalism*. In doing so, he draws upon a stock of meanings that have come to be associated with that word. That is why he uses the word: because of the meanings it contributes to the representation he is creating. Thus Bloch overstated his case when he wrote, "nearly every historian understands the word as he pleases." If that were the case, then there would be no reason to use the word at all, since it could not be relied upon to elicit any specific meanings.

But Bloch is right that the different "'feudalisms' throughout the world" also have different meanings, because the contribution of meaning is not one-way. By using the word *feudalism*, the historian is also making a proposal about the meanings of that word, namely that they should include the events of the Zhou Dynasty as he has represented them. A historian's proposal may not be successful, and in most cases it will not be. But if it is, and his history is influential, then he will have shifted or expanded the meanings of *feudalism*.

Thus a word like *revolution* does not, as McCullagh suggested, refer to a known species with

[1] See Grafton (2002) for an example showing that historians do not simply "confirm that a revolution has occurred" before moving on to debating why.

which a historian can identify some fossilized process of historical change dug out of the archives. The word is a tool, chosen for the expected meanings it will have for some audience. The expected meanings of *revolution* are not permanently fixed by virtue of the word's "standing for" or "pointing to" a specific form of historical change. This is why historians can and do constantly debate and question its applicability to any given part of the past.

But this questioning can only go so far. Historians can choose their terms tentatively, but they still must choose them, and for terms to be usable they must have reasonably stable meanings (Nardin, 2001, p. 155). And most of the terms that a historian employs are not ones that she is necessarily aiming to define new meanings for. Historians do not work in isolation. A historian never develops her concepts "from scratch" or "discovers" them in the archives. Instead, she produces them by transforming concepts developed by her peers and predecessors. As Michael Oakeshott (1933/1966) put it:

> History ... begins not with the collection of isolated particles of data, nor with a universal doubt, nor with a blank and empty consciousness, but with a homogeneous world of ideas. No other starting place is to be found, none other is possible ... The process in historical thinking is never a process of incorporation; it is always a process by which a given world of ideas is transformed into a world that is more of a [coherent] world. (pp. 98–99)

Historians read many of the same books, read each other's books, write in response to one another, speak at conferences, and in a myriad of ways pick up one another's ideas and compare their various representations. It is by virtue of these neighboring or competing representations, and the way that the meaning of each enriches or circumscribes the meanings of the others, that a word like *Christianity* can be said to have an expected meaning, although that meaning shifts as historical discourse progresses.

Frank Ankersmit (2012) has drawn a parallel with Ferdinand de Saussure's theory of how words acquire meaning (pp. 138–152). Saussure argued that the meaning of a word is defined in relation to the meanings of neighboring words, where neighboring words are either near-synonyms or those commonly used together. So, for example, the meaning of *sob* is in part a function of how it stands in contrast to *bawl*, and vice versa. Ankersmit contends that something similar holds for colligatory concepts. Each historian who writes a history of something she calls a *revolution* makes a unique proposal for the meaning of that word. But that meaning is defined in relation to a whole set of different proposals made by others.

To summarize, individual historians construct unique colligatory concepts to which they give names like *Genghis Khan*, *feudalism* or *Bolshevik Revolution*. But these concepts are always constructed using words associated elsewhere with colligatory concepts constructed by others. Historians must accept much of the meaning of these other concepts, else they would not recognize themselves as participating in a common endeavor. To the extent that historians accept parts of one another's colligatory concepts, we can say that there are some shared expected meanings associated with the words that name them. And in fact it is these shared expected meanings that make these words useful to historians. But these meanings, while often relatively stable, are not fixed: when historians construct colligatory concepts and give them names like *modernity* or *Napoleon* they simultaneously attempt to reinforce, change, or enrich the shared expected meanings of those words. Below I consider how we might better refine our understanding of these shared expected meanings by bringing into focus common patterns among texts that convey related colligatory concepts. But first I will examine more closely the

different kinds of colligatory concepts historians construct.

Kinds of Colligatory Concepts

Different kinds of colligatory concepts can be distinguished based on the role they play in historical reasoning. The first kind of colligatory concept is the *character*. W. H. Walsh explained the role of characters in history as follows: "In every history there is a continuing subject in whose fortunes the historian and his readers are interested, and there are successive situations, as it were modes of that [subject], which it is the historian's business to depict and explain" (Gruner & Walsh, 1969, p. 153). These "continuing subjects" are the characters of history, and without them, there can be no history. Characters fill the role of agents in the semantics of action that historical understanding presupposes.

I am asserting that characters are a kind of concept constructed by historians. When one thinks of the characters of history, one usually thinks of individual people, such as Napoleon or Rosa Parks. It may seem odd to assert that *Rosa Parks* is the name of a concept. Wasn't Rosa Parks a real person? Am I suggesting that historians invented Rosa Parks?

Of course Rosa Parks was a person. But *Rosa Parks* is also the name of characters in many histories of the civil rights movement. One should not confuse the representations developed by historians with the Rosa Parks who lived and breathed. The unity and continuity of actual people is guaranteed by their bodily existence, but historians may use other criteria for the continuity of their characters. Hjørland (2009) gave the example of Ludwig Wittgenstein. Philosophers and biographers often distinguish *early Wittgenstein* and *late Wittgenstein* as referring to separate concepts due to the fundamental change in his thinking that is believed to have occurred during his lifetime. In these cases one actual person has been separated into two characters, using the intellectual content of that person's work, rather than the physical continuity of the person's body, as the criteria for continuity.[2]

Another example is Saint Patrick, the missionary who brought Christianity to Ireland. Patrick is a subject of early Irish history and plays an important role in popular historical discourse as well. But it has been argued that there were actually two living persons represented by the historical character named *Saint Patrick* (O'Rahilly, 1942). If so, then this would be a case in which historical representations have combined two actual people into one character. Whether or not this is actually the case, the fact that such an argument is meaningful at all illustrates the distinction between people in the past and characters in representations of the past.[3]

Individuals are the prototypical characters. It is our experience of living in the world with other individuals, observing their actions, attributing to them motivations, and so on that gives us the competence to understand historical representation. But characters need not be individuals. In written history, anything that serves as the subject of an active or passive verb can be a character

[2] One might object that *early Wittgenstein* and *late Wittgenstein* refer to subsets of Wittgenstein's writings, rather than to characters. But this is exactly the point: writers using these phrases construct representations of Wittgenstein (characters) that present his writings as the salient aspect for understanding him (Ankersmit, 2012, p. 68–73).

[3] I am *not* saying that historians write about concepts rather than about people. A biographer of Wittgenstein is writing about Wittgenstein, not about a concept called *Wittgenstein* (Wilson, 1968, p. 66n7). In contrast, I *am* writing about a concept (character) called *Wittgenstein*. I am arguing that the biographer of Wittgenstein, in writing about Wittgenstein, is constructing a particular concept called *Wittgenstein*. One ought not confuse the thing being written about with the concept of that thing thereby constructed. In other words, one should not confuse that which is represented with the representation.

(Ricœur, 1983/1984, p. 197). Typical examples include communities, nations, classes, races, and institutions. But characters can be more exotic than these: in his analysis of Fernand Braudel's *The Mediterranean and the Mediterranean World in in the Age of Philip II*, Ricœur (1983/1984) identified *the Mediterranean* as the "collective hero on the stage of world history" (p. 215). What justifies treating the Mediterranean as a character? One cannot observe the Mediterranean's actions and attribute motivations to it, as one might do with a person.

William Dray (1957/1966) argued that to treat the Mediterranean as a character is simply a kind of ellipsis, a shorthand for indirectly referring to individuals who represent or are members of the collective (pp. 140–141). Dray's argument is not entirely convincing, however. Historians do not always indirectly refer to individuals when they employ collective characters. Veyne (1971/1984) gave the example of a historian studying Nivernais peasants (pp. 60–61). When such a historian makes assertions using the phrase *the Nivernais peasant*, she is not indirectly referring to some typical member or members of that group. Instead, she is abstracting from individuals some specific features such as marriage customs and economic activity, and then bringing together those abstract features into a new concept, which she calls *the Nivernais peasant*. The concept is this fusion of abstractions, not an indirect reference to individuals.

Ricœur explained how collectives are understood as plausible characters using Maurice Mandelbaum's definition of *society* as an example:

> A *society* ... consists of individuals living in an organized community that controls a particular territory; the organization of such a community is provided by institutions that serve to define the status occupied by different individuals and ascribe to them the roles they are expected to play in perpetuating the continuing existence of the community. (Mandelbaum, 1977, p. 11, quoted in Ricœur, 1983/1984, p. 195)

Ricœur (1983/1984) argued that this definition provides three separate criteria of unity and continuity (pp. 195–196). First, there is contiguous space, the "particular territory" inhabited by individuals. Second, some institutional structure unifies these individuals and defines the roles they play in that unity. Third, the territory is occupied and the roles are played continuously over time. These three criteria rely upon individuals, but cannot be reduced to them, as no particular individual or individuals taken in isolation can be said to have occupied that territory, taken on those roles, or existed over that time. The society as collective character depends upon our understanding of individuals and their behavior but is not shorthand for referring to some particular individuals.

Characters are what Ricœur referred to as "first-order" concepts in history. Characters are subjects of change, the identity of which is provided by their temporal and spatial continuity. By abstracting from these first-order concepts, historians derive "second-order" colligatory concepts or *ideal types*.

While characters are understood to have a continuous existence localized in time and space, ideal types abstract away from specific times and places. Historians borrow many ideal types from the social sciences. Ideal types are also constructed in what Mandelbaum (1977) called "special histories," for example histories of French literature, or of Gothic architecture, or of chemistry (pp. 33–35). In order to write such a history, a historian must develop a concept called *chemistry* or *French literature* that can be postulated as the subject of change. This subject may not be (and in the case of ideal types is usually not) continuous in space and time. In this case, the continuous identity of the subject of change is constructed by the historian from some discontinuous series of things. These things might be scientific discoveries, bound together by a

concept the historian calls *chemistry*, or they might be literary works, bound together by a concept the historian calls *French literature*.

The term *ideal type* was coined by Max Weber. Weber (1949) defined the ideal type as a purely theoretical construct that is used to analyze concrete historical things (p. 90). The historian selects and emphasizes certain features or aspects of some set of things and combines these aspects into an idealized concept, the ideal type. He can then analyze specific things by comparing those things with the ideal type. The ideal type is not something that can be observed or discovered. Nor is it an abstract class of which instances can be identified, or a simple summarization of common features of some set of things. It is a representation constructed to enable analysis by focusing attention on certain aspects of reality and seeing how the construct fails to capture that reality.

Weber (1949) singled out concepts called *capitalism* as typical examples of ideal types (p. 91). Historians and social scientists have developed many different concepts they called *capitalism*. Each concept integrates certain observed features of economic activity, but none of them accord with any actually existing economic system without discrepancy. Yet each claims to capture the "basic idea" of some economic reality. Each does so, but only from a specific perspective—the particular perspective that led to the selection of certain features as significant. Thus, there can be as many ideal types named *capitalism* as there are ways of being concerned with economic activity.

In his discussion of ideal types, Weber accentuated the effort to construct rigorous and precise analytical concepts with which to examine reality. This effort is characteristic of the social sciences, and of history to the extent that it borrows these concepts from the social sciences and uses and develops them in a rigorous manner. But ideal types are not always used so analytically in historical practice. Marrou (1954/1966) noted that when historians use ideal types, they often do so as a kind of convenient shorthand for describing some ensemble of facts (pp. 172–173). Both Marrou and Weber, however, warned against forgetting that ideal types are representations. Ideal types, like other kinds of colligatory concepts, are produced through historical reasoning and discourse. It is a mistake to hypostatize them as Walsh and McCullagh did (Weber, 1949, p. 94).

The third category of colligatory concept is the *period*. The French Revolution and the Renaissance are canonical examples of periods. A period, like a character and unlike an ideal type, is localized in time and space. But where the unity and identity of a character is provided by its continuity through that time and space, a period is discontinuous over space and time.

Arthur Danto (1965/2007) illustrated this by considering how a historian might construct a representation to be labeled *French Revolution*. She might narrate the activities of a character called *the French people* during some span of time around 1789. In addition to or in place of *the French people* she might choose other characters: individuals like *Louis XVI* or *Robespierre*. Her choice of characters will help determine the structure of her period, and in this sense, her period is derived from and depends upon her characters. Most of her characters will probably be located in France, but some may not be. During the time under examination, the people represented by her characters engaged in some activities that she does not consider part of the Revolution and that as a result will not be included in her representation. As a result, the concept she calls *the French Revolution* is necessarily "exhibited discontinuously over French soil and eighteenth-century time" (Danto, 1965/2007, p. 166). The unity and identity of her period is provided not by its spatiotemporal continuity but by her narrative.

Where ideal types are analytic constructs, periods are synthetic constructs (Ricœur,

1983/1984, p. 206). Ideal types select and emphasize specific aspects of reality such as economic activity or familial structure, while periods encompass "the totality of all that we are able to know of the object thus defined" (Marrou, 1954/1966, p. 174). Periods are totalities that include or depend upon both ideal types and characters. Being constructed out of these other colligatory concepts, periods are the most abstract of colligatory concepts, despite seeming to be somewhat concrete given their localization in space and time. This seeming concreteness is reinforced by the tendency to treat periods as *subjects* in systems for organizing information.

Patterns of Colligation and Subjects

Colligatory concepts should not be confused with subjects, through they may share the same names. We may find *civil rights movement* in a list of subject headings, where it is used to group together a set of works that are said to be "about" the civil rights movement. These works share a subject, but they do not share a colligatory concept, since each work constructs a unique one.[4] The difference between subjects and colligatory concepts is easier to see in the case of colligatory concepts that are given new names, such as *age of fracture*. *Age of fracture* does not appear in subject heading lists; currently that phrase names only the single colligatory concept constructed by Daniel Rodgers. If his concept becomes as influential as the one Michelet named *Renaissance*, however, it could come to share its name with a subject: a subject that is used to group the works that borrow the name *age of fracture* for their own colligations.

Colligatory concepts highlight an issue with the grammatical model of subject analysis (Svenonius, 2000, p. 47). According to the grammatical model, we can determine the subject of a textual work by incrementally building up from the level of sentences. It is assumed that sentences are about their grammatical subjects, and that a collection of sentences with *Napoleon* as their grammatical subject result in a text about Napoleon. As Svenonius (2000) points out, this model assumes a referential use of language: the grammatical subjects of sentences are assumed to refer to things in the world that those sentences are about. More problematically, whole texts are assumed to refer in the same manner.

This model fails for historical texts. Given a history that has been assigned the subject *Roman Empire*, we may find relatively few sentences with *Roman Empire* as their grammatical subject. Instead we will find grammatical subjects such as *Latins of Constantinople* and *Asia* (Wilson, 1968, p. 75). The text is assigned the subject *Roman Empire* not because the grammatical subjects of its individual sentences refer to some thing called *Roman Empire*, but because the text taken as a whole constructs a representation that its creator has named *Roman Empire*.[5] Historical texts taken as a whole represent rather than refer (Ankersmit, 2012, pp. 87–101). Historical language can be used referentially, and the subjects of individual sentences in a historical text do refer. But histories taken as a whole are representations, expressive texts intended to produce experiences of the past. The grammatical model of subject analysis is inappropriate in this case (Svenonius, 2000, p. 48).

The grammatical model of subject analysis leads to exactly what Marrou and Weber cautioned against: the hypostatization of colligatory concepts. When a subject analyst assumes

[4] In fact there is some similarity between a colligatory concept as I've explained it here, and a "work" in the sense defined by the Functional Requirements for Bibliographic Records. For each colligatory concept there is a corresponding work (though the reverse is not true since not all works colligate). Like colligatory concepts, works can only be defined extensionally, and these definitions can only be justified pragmatically.

[5] Or, in this case, *Decline and Fall of the Roman Empire*.

that various texts using the word *Renaissance* are each referring to some independently existing thing and that these texts are thus "about" that thing, he makes the same mistake as McCullagh did. Robert Fairthorne (1974) criticized

> the implicit conceptual background of classificatory acting ... a background of belief in a landscape of topics, to which books and other recorded discourse can be assigned, and the belief that this landscape is unique, independent of classifiers, and can be described in as much detail as you like by an appropriately omniscient and omnipotent observer. (p. 404)

The landscape of independently existing subjects is an illusion created by the grammatical model of subject analysis. Patrick Wilson (1968) proposed an alternative model of subject analysis that might be thought to better fit historical works, which he called the "appeal to unity" (pp. 86–88). Wilson wrote that

> A writer starts with some idea of what he is going to write about; the discovery of the "true whittled-down subject" ends only with the completion of the work. For in the process of writing, he is forced to select and reject among things that might be said, that somehow bear on or are related to the kernel or initial notion. "There has to be unity and completeness"; what he says must all hang together, he must say enough but not too much. As he goes on, he becomes more and more assured of what belongs and what does not belong in the writing, of what is required and what is dispensable, what is "necessary" to the completeness of the writing and what is unnecessary. This can be seen as the gradual formulation of rules of selection and rejection, and that gradual formulation is exactly the same as the gradual realization of what one's "true whittled-down subject" is. (pp. 86-87)

It should be clear that Wilson's "whittled-down subject" is precisely what I have been calling a colligatory concept, "that [concept] by reference to which the presence of the rest can be explained" (Wilson, 1968, p. 87). Wilson rejected the "appeal to unity" as a method of subject analysis on the grounds that 1) the subject analyst cannot formulate the "rules of selection and rejection" that would precisely describe the subject, and 2) even if the analyst could formulate such rules, they would be his invention, and reflect just one possible definition of unity and completeness.

Wilson's first point is correct. Not even the writer herself can formulate such rules. If she were able to formulate rules defining her colligatory concept, she could simply publish the rules and save herself the trouble of writing a book (or making a film, or designing an exhibit). Wilson's second point, however, confuses matters. There are not "several possible ways in which we can make [a text] seem reasonably unified" (Wilson, 1968, p. 88). A writer may have several potential unifying ideas in mind before a text is written, and she may consider and discard several such ideas during the writing process, but the already completed text is what it is. The colligatory concept it expresses is its unifying idea, developed through the research and writing process. The selected facts, ideas, and events are those that were in fact selected; if different selections had been made, they would add up to a different colligatory concept. It is nonsense to speak of "rules of selection and rejection" in this case. One might as well appeal to rules for deciding which brushstrokes van Gogh should have included in *The Starry Night*.

Such rules might make sense, however, for defining a *subject*. Each history expresses a unique colligatory concept, but subjects are intended to group together multiple histories. In this

case the problem is not how to decide what facts, ideas, and events should be selected for inclusion in a history of the French Revolution, but to decide which histories should be listed under the subject heading *French Revolution*. As it turns out, however, no rules can be formulated to determine this decision either. One cannot give an intensional definition of the subject *French Revolution* that specifies what facts, ideas, and events a text on that subject *must* include (Ankersmit, 1983, p. 150). Given all the histories ever written on that subject, one may not be able to identify a single fact, idea, or event that is included in *every* one.[6] A decision to assign the subject *French Revolution* to any particular text can only be justified pragmatically.

So Wilson was correct that the unifying (colligatory) concepts of histories cannot serve as subjects for organizing those histories. But what *should* be the relationship between colligatory concepts and subjects? What should be the connection between 1) saying that a text expresses a colligatory concept that has been given the name *Roman Empire*, and 2) saying that it is a text to which our methods of organization assign the subject heading *Roman Empire*? The answer is that subjects should reflect *patterns of colligation*.

As explained above, while historians construct unique colligatory concepts they do not do so in isolation. Historians write in response to other historians and construct their colligatory concepts by distinguishing them from those that came before, implying a significant degree of overlap. Historians inspired by the colligatory concepts of Michelet and Burckhardt used the term *Renaissance* to name their own concepts, which are influenced by and share some qualities with their eponymous predecessors. Given these shared qualities among concepts, we presumably should be able to perceive some common patterns in the texts that express them.

Ankersmit (1983) speculated that one could discover patterns of shared qualities among colligations by algorithmically analyzing texts (p. 145). By translating the sentences of texts into propositions, he suggested, and defining for each proposition a binary feature (variable) based on whether or not a given text contained a sentence expressing that proposition, one might cluster together texts with similar feature sets (indicating overlapping propositions.) These clusters, he argued, would reflect patterns of colligation.

Ankersmit's proposal faces some significant practical problems, especially the problem of how to translate texts into comparable propositions. But the general idea that we might be able to discover patterns of colligation through clustering texts seems sound. Consider probabilistic topic modeling (Blei, 2012), which has recently become popular as an automatic technique for organizing large collections of texts through clustering. Given only a set of texts, one can use this technique to automatically produce 1) a set of "topics" (probability distributions over words) that capture common patterns of language use among those texts, and 2) an assignment of texts to those topics, where each text may "belong" to several topics in different proportions. In practice, this automatic organization of texts turns out to be quite useful, especially for very large collections of texts for which manual subject organization would be extremely labor-intensive.

The conceit behind topic modeling is that texts are "generated," word-by-word, by means of a probabilistic process. This process has two important characteristics. The first involves the notion of a "topic," which is a probability distribution over words. One can imagine a topic as a massive roulette wheel, the pockets of which are labeled with words rather than numbers. The pockets are of varying sizes, so that some words are more likely to be landed upon than others. For example, the wheel for the topic of "agriculture" might have its larger pockets labeled with

[6] Wilson (1968) made the same point when he wrote that "there is no single feature … that we can specify in advance in a general statement of this sort: 'All the writings in this collection that have feature F must … be at place N'" (p. 91n29).

words like *plant*, *food*, *wheat*, and *crop*, reflecting the intuition that a text covering that topic is more likely to use those words. The idea is that a text is created through a sequence of wheel spins, each of which selects the next word of the text.

So each word of the text is selected by the spin of a wheel, but not necessarily the *same* wheel. This is the second important characteristic of the text-generation process as imagined in topic modeling. One word of a text might have been selected by a spin of the "agriculture" wheel, but the next word could have been selected by a spin of the "Egypt" wheel, which has its larger pockets labeled with words like *Egypt*, *Egyptian*, *Nile* and *Alexandria*. So before a topic wheel is spun, a prior wheel is spun to select a topic such as "agriculture" or "Egypt."[7] The intuition here is that no text covers only a single topic, but involves a combination of topics in different proportions. So each word of a text is actually generated by two spins: the first to select a topic, and the second to select a word from that topic.

But topic modeling is concerned, not with generating texts, but with organizing them. So the assumption is made that the wheels that generated the texts have been destroyed. Topic modeling is a statistical procedure for reconstructing the destroyed wheels, given only the texts that remain. This reconstruction of the hypothetical text-generating process produces a set of probability distributions over words (the "topics") and, for each text, a probability distribution over topics (which can be interpreted as an assignment of topics to that text in varying proportions).

The "text-generating process" posited by topic modeling is, of course, is simply an elaborate metaphor. No one believes that texts are actually "generated" in this way. There is no master list of topics to choose from, nor are there Platonic topics that establish the likelihood of words being used. Yet the metaphor does capture a couple of important intuitions we have about texts, namely that they involve various concepts in combination, and that we are more likely to use certain words to communicate certain concepts. More importantly, this metaphor can be modeled mathematically and thus provides a way to computationally find patterns of language use in a collection of texts.

The patterns of language use discoverable through probabilistic topic modeling are a computationally tractable substitute for patterns of colligation. They are not identical to patterns of colligation, which are only truly discoverable by reading texts, watching films, attending exhibits, and so on, and noting similarities among the various representations. But these activities are time-consuming and labor-intensive, so computationally tractable substitutes are necessary if we wish to apply the theory of colligation to the practical problem of subject analysis.

The theory of colligation leads to a view of subject analysis that avoids the problematic illusion of an independent "landscape" of subjects. What any history is "about" is the colligatory concept it constructs, the concept "by reference to which the presence of the rest can be explained" (Wilson, 1968, p. 87). This concept is unique to each history. But histories are written not in isolation but under the influence of and in dialogue with previous histories. Thus colligatory concepts are composed of mixtures of influences and reactions to others' colligations. These conceptual overlaps are what enable us to pick out patterns of colligation, which we call subjects.

Conceptual overlaps can only be discovered through intellectual labor, but we can identify substitutes that are computationally tractable and thus require less labor. The "topics"—common patterns of language use—identifiable through probabilistic topic modeling are one possible kind

[7] This two-level selection process is why topic models are often described as having a hierarchical structure.

of substitute for subjects. It is important to keep in mind, however, that identifying patterns of colligation can never be a precise or exact procedure. There will be always be many possible patterns depending on how one interprets "similarity" among colligatory concepts. For any given interpretation of similarity, there will always be boundary cases that could belong to more than one pattern. There are regularities in the contours of the concepts developed by historians over time, but there is not one correct way of characterizing those regularities.[8]

Unifying Scholarly and Institutional Information Organizing

By this point it should be clear that there are strong parallels between the task of the historian, faced with the problem of how to invent a concept that groups together the facts, events and ideas she has inferred through her process of inquiry, and the task of the subject analyst, faced with the problem of how to identify a subject that usefully groups the documents he is organizing. Wilson (1968) made the connection between the two tasks explicit when, considering the problem of identifying the subject of a biography, he noted that "the events of a life can be grouped variously into segments and strands picked out in a multitude of ways," and that the unifying principle under which we choose to group these events is "a principle which we ourselves supply" (p. 84). For both the historian and the subject analyst, then,

> The groups we will recognize will be those for which we already have names, groups assembled on the basis of some concept we already possess, groups that seem to us "natural." ... But there may well be other ways of grouping things referred to that seem equally "natural" to those who have, or think of employing, different concepts … the results will depend heavily on our ingenuity in finding ways of assembling groups, on our stock of available notions, on our ability to unify a writing by discovering or inventing a concept which all or much of the writing can be taken as exemplifying in one way or another. (Wilson, 1968, p. 85)

The connection between colligation and subject analysis is at the core of a more general set of relationships between scholarly information organizing and institutional information organizing. These relationships were obscured in the past due in part to the material constraints of our organizing systems. The historian's "five-by-seven-inch cards" recording "chronologies of events in the lives of the subjects" were "held together with rubber bands" and stored in "metal file boxes" and thus could not be easily connected to the three-by-five-inch cards in the library's card catalog, the dog-eared pages of the archival finding aid, or the museum's adhesive labels (Case, 1972, p. 72).

These material constraints have changed rapidly, as we are constantly being made aware. Books, manuscripts, artifacts and even buildings are being digitized or "born digital" at a fantastic rate. The Web has grown into a ubiquitous standardized infrastructure for integrating organizing systems at every scale, from tools for individual researchers to massively collaborative databases. New approaches to creating and managing descriptions of resources promise to move us from "one-size-fits-all" descriptions, created once and rarely updated, to

[8] Probabilistic topic modeling is therefore a tool particularly well-suited for finding useful approximations of these regularities, because it makes few a priori assumptions about what they are. "Topics" are treated as purely hypothetical and unobservable entities, and even the number of different topics is an arbitrary choice made by the person doing the topic modeling. Advocates of topic modeling are careful to emphasize that it is not a technique guaranteed to lead to useful organization, but a way of suggesting possible organizations to a human mind.

flexible descriptions assembled "on the fly" from constantly updated data feeds. These developments enable us to quickly and easily build large corpora of texts, images, and other media. Finding patterns in these corpora is becoming easier thanks to cheaper hardware and advances in parallel computing and statistical analysis.

We now have the technologies to connect the "bibliographies, notes, personal finding aids, and assessments by scholars of which items are important and unimportant"—what Dan Cohen (2008, pp. 481–482) has called the "hidden archive"—to the more formal apparatuses for organizing information. Some tentative steps are being taken in this direction, as the recent embrace of Linked Data by some scholars and libraries, archives and museums exemplifies. Place name gazetteers, encyclopedias, biographical directories, thesauri, subject headings, and other long-established tools are becoming shared services for finding, relating, and providing contextual background for resources. The elements needed for such services—including identifiers for terms and entities of interest and various kinds of semantic relationships for linking them to one another—are starting to be published and aggregated into interoperable wholes.

In this new environment material constraints persist, as digital archivists and preservationists well know. But the major challenges of connecting scholarly information organizing and institutional information organizing are no longer material, but conceptual. The first conceptual challenge is to re-imagine the functions of organizing systems. Tools such as thesauri and classification schemes primarily have been used for indexing and retrieval. But in an era of vast digital archives and powerful search algorithms, the key challenge of organizing information is to construct systems that aid understanding, contextualizing and orienting oneself within a mass of resources. Building such systems is less like information organizing as it is traditionally understood, and more like constructing syllabi or producing exhibits.

Peter Lee (2004), writing about syllabi for history education, argued that these systems must help users recognize and evaluate various sorts of claims, such as the claim that a specific process of technological development is best understood as a *revolution*. A successful organizing system would help one understand how such claims are related to both the kinds of questions asked and the kinds of evidence used to support the claims. Lee emphasized that the system cannot simply outline a single story, since it must organize a multitude of stories. Nor should the organizing system try to include the kind of detail found in full-scale historical narratives: it should abstract away from that detail in order to show patterns in how change and continuity are conceptualized. Finally, the system ought to scale to different levels of historical sophistication and be modifiable. Modifications might include making the links among related concepts more or less complex and subdividing and recombining conceptual groupings.

Lee's proposed requirements echo Donald Case's call to apply "problem-oriented" principles of organization to the design of systems and services for historians. Case (1991) had concluded that "history may be less well served by classification and indexing than any other academic field" (p. 79) and wished to remedy that situation. The problem, Case argued, was that library organization had focused on modeling a body of *information* about the past by subdividing it into places and periods, which were treated as a pre-existing landscape of subjects. To better serve historians, it needed to focus on modeling *discourse* about the past, by organizing around the kinds of questions historians ask. In particular, Case argued, librarians need to develop ways to index "the 'point of view' or 'context' that is so often the central concern in discussions of

historical problems" (pp. 79–80).[9]

Ankersmit (1983) contended that the point of view proposed by a history can only be recognized by comparing it to other histories:

> Being aware of the possibility of other views of the past is an essential part of the meaning of "having knowledge of the past" ... [This is] not primarily because each narratio [history] will mention facts not mentioned in others, but because only the presence of other narratios enables us to draw the contours and to recognize the specificity of the view of the past presented in each narratio ... The past has to be covered with a network of narratios whose overlappings enable us to decide on the objectivity of narratios on relatively new historical topics ... One single man can discover truths about nature, but the possibility of knowledge of the past requires the presence of and the opposition to competing insights in a much more dramatic way. (pp. 219–220)

The theory of colligation provides a way of articulating what it means for each history to propose its own point of view. The application of this theory to the problem of subject analysis addresses the challenge of how to draw contours that group and individuate these various points of view.

There is a tendency among information organizers to shy away from describing or indexing points of view or interpretive judgments. They prefer to leave interpretation to those whom they serve and stick to documenting what they believe to be the unambiguous facts needed for retrieval. But this is a false division of labor. Information organizing necessarily involves interpretive judgments, because as Robert Stalnaker (1967) argued these judgments

> have a different status and function from factual statements. The relation between interpretative judgments and the particulars used to support and illustrate them is different from the relation between statements of fact and their evidence, or between generalizations and their instantiations ... The interpretative judgments serve ... partly as *organizing principles* ... They provide *criteria of relevance* for the selection and emphasis of facts. (p. 176)

Different interpretive judgments result in overlapping and potentially contradictory organizing principles. Organizing systems ought to make these overlappings evident and show the contours of differences in perspective that distinguish individual judgments. Far from providing a more "complete" view of a static landscape, organizing systems should multiply and juxtapose views. As Geoffrey Bowker (2005) has argued

> the goal of metadata standards should not be to produce a convergent unity. We need to open a discourse—where there is no effective discourse now—about the varying temporalities, spatialities and materialities that we might represent in our databases, with a view to designing for maximum flexibility and allowing as much as possible for an emergent polyphony and polychrony. (pp. 183–184)

[9] See also Tibbo's (1993) authoritative study of historical abstracting, in which she concluded that guides to historical literature need to not only identify entities "in" histories such as the names of places, characters and events but also to identify the meta-concepts "around" histories, such as interpretive stances, patterns of argumentation, disciplinary traditions, and methodologies (pp. 191–193).

The demand for polyphony and polychrony leads to a second challenge, which is to find ways to open the construction of organizing systems to wider participation. How might academics, librarians, teachers, public historians, curators, archivists, documentary editors, genealogists, and independent scholars all contribute to a shared infrastructure for linking and organizing historical discourse through conceptual models? If this challenge can be addressed, the next generation of organizing systems could provide the infrastructure for new kinds of collaborative scholarship and organizing practice.

But even supposing that enough people decide that they have more to gain from contributing to a shared organizing infrastructure, there remains the problem of connecting conceptualizations at different orders of complexity. Each history labeled with the phrase *the French Revolution* is a unique representation, but at any given time and place there are also some shared expected meanings of *the French Revolution*. How should we connect the shared meanings needed to access and comprehend large swaths of historical discourse to the rich and complex representations of individual scholars?

The individual scholar or team of scholars organizes information to the extent necessary to provide comprehensible structure for an individual history. The scholars' "hidden archive" records decisions made about how to represent that structure. The larger challenge of organizing historical *discourse* involves not just a single history but a profusion of histories, generated in parallel by contemporaries and in sequence by different generations. Across this multiplicity of perspectives, organizing systems cannot hope to "reconcile" divergent views but must be content with establishing some common referents and shared structure. Identifying these points of consensus is necessary to highlight the differences among individual perspectives.

Building systems that can scale across these orders of complexity cannot be done without the aid of computation. Adopting computational tools requires that concepts be made tractable for computation. Willard McCarty (2005) has suggested that the trend toward "digital humanities" can be viewed as a shift from implicit concepts to explicit models. Models are recognized as constructs to be pragmatically manipulated, while concepts may be viewed as simply evolving. The distinction between concept and model, McCarthy argued, has been sharpened by advent of computing:

> Two effects of computing sharpen the distinction between 'concept' on the one hand and the 'model' on the other: first, the computational demand for tractability, i.e. for complete explicitness and absolute consistency; second, the manipulability that a digital representation provides. (p. 25)

The cost of achieving tractability is the procrustean simplification of concepts. But scholars are increasingly willing to accept this cost for the benefit of greater manipulability. Information organizers are already comfortable with simplifying and formalizing concepts to achieve certain objectives, yet they have been slow to recognize the benefits of manipulability. Perhaps what the practice of organizing information needs is a shift toward a modeling paradigm. How might the description of resources be re-envisioned as a form of modeling? As I've argued here, topic modeling is one computationally tractable and theoretically defensible way to model "aboutness" for the purpose of subject analysis.

By re-imagining organizing concepts as models, it may become easier to escape the straitjacket of our legacy systems and narrow the wide "semantic gap" separating conceptualization as practiced by scholars and the formalization of those concepts in organizing systems (Rubanowice, 1975). These new systems will have to be more flexible and adaptive than

the kinds of organizing systems we are accustomed to building. The challenges are great, but the possibilities are exciting.

To build these new systems, however, we need to come to a more sophisticated understanding of what it is we are doing when we organize information and why we are doing it. We should recognize the arbitrariness of the boundaries dividing scholarly information organizing from institutional information organizing. Above all, we must successfully navigate between "the lure of the abstract and the tyranny of the particular" (Mink, 1966, p. 47). We should strive to design organizing systems that neither hypostatize totalizing concepts, nor simply catalog dull facts, but that reflect the rich diversity of representation that characterizes historical practice, or indeed any humanistic endeavor.

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