Sum of all knowledge: Wikipedia and the encyclopedic urge

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4. Positioning *Wikipedia*

The list is the origin of culture. It's part of the history of art and literature. What does culture want? To make infinity comprehensible. It also wants to create order -- not always, but often. And how, as a human being, does one face infinity? How does one attempt to grasp the incomprehensible? Through lists, through catalogs, through collections in museums and through encyclopedias and dictionaries.

Umberto Eco
Interview with *Spiegel Online*, 2009

4.1 Introduction

Both the historical survey of the encyclopedic form and a closer analysis of *Wikipedia* have highlighted that, throughout history, the defining characteristics of all encyclopedias can be understood through an analysis of their approach to three specific concepts: an understanding of knowledge, an idea of authorship and attributed authority and finally, as a function of the principles through which they organize content.

In the previous chapters I analyzed how the modern encyclopedia emerged in Western Europe as a result of a continuous evolution of these concepts, beginning with Ancient Greece and culminating in the popular encyclopedia sets of 20th Century. Later, I demonstrated the struggle to transcend these notions during the span of the 20th century, resulting in technological breakthroughs such as the personal computer and the Internet, along with the unique social dynamics of online collaborative communities. My historical survey illustrated how *Wikipedia* can be considered as a culmination of multiple instances of such efforts.

In my analysis of *Wikipedia*, I illustrated how the online, open and collaborative encyclopedia stems from both the encyclopedic tradition of the past centuries and the new affordances of the inventions of the 20th century. The following chapter is the culmination of this study, where the three concepts whose central importance has been demonstrated earlier will be analyzed individually. This chapter is organized in three sections, each devoted to one of the key concepts noted above. Within each section I will start by

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presenting a brief account of the historical evolution of the concept in question. The recorded studies of each of these concepts are as old as the history of writing and they can all be considered as pillars of philosophical inquiry.

While an exhaustive account of the history of these concepts would be beyond the scope of this study, I will highlight key revolutionary moments at which the dominant mode of thinking has dramatically shifted through propagation of philosophical ideals or changes in society. While this study is not intended to be philosophical in nature, a historically focused overview of the concepts in question will serve as a framework for the analysis ahead.

Following the outlining of these concepts, I will analyze the findings of the first chapter through the framework just elaborated. The aim of this second section is to establish a concise overview of the relationship between the concept in question and the history of encyclopedias up to the 21st century. The final part of each individual section will evaluate the findings of the second and third chapters, illustrating how *Wikipedia* and its ideological and technological precursors have conceptualized the future of encyclopedias.

Through these subsections, each section aims to illustrate the philosophical foundations of the concepts in play and to put into stark contrast the treatment of these concepts in the Western encyclopedic tradition and *Wikipedia*. While such comparisons have been alluded to in other studies, the broader historical perspective offered in the current analysis promises to highlight the revolutionary aspects of *Wikipedia* in a new light, while uncovering surprising continuities previously overlooked.

At the conclusion of this chapter, a more complete picture of the evolution of the encyclopedic ideal through ages, so far culminating in *Wikipedia*, will emerge, fulfilling the analytical objective of this thesis and leading to concluding observations.

4.2 Compendia of Knowledge

4.2.1 Knowledge on Knowledge

The questions regarding the origins and conditions of knowledge and the quest to identify methods of reliably achieving it are as old as the history of philosophy itself. This rich history and the entire discipline of philosophy stemming from it, specifically as understood under the heading of epistemology, address fundamental questions regarding the most basic ways in which humans perceive the world. That said however, only a subset of these questions is directly relevant to the present study. Furthermore, the discussion of knowledge and encyclopedias is inextricably intertwined with questions concerning authority, the subject of the next section. However, as these conceptions draw upon established norms that coalesce around knowledge, it is fitting to start with the more fundamental question of how we acquire knowledge.

The Cambridge Dictionary of Philosophy, identifies three components of knowledge, and therefore the study of epistemology ("epistemology"):

   i. The defining features

  ii. The substantive conditions or sources

 iii. The limits of knowledge and justification

Philosophers have strived to define these features, their focus mainly being concentrated on propositional knowledge (usually illustrated with the statement "*that* something is so"). *The Cambridge Dictionary* identifies the standard analysis of propositional knowledge with the definition "justified true belief" (ibid). While in prominence since the time of Plato, the standard analysis is far from universally accepted and debate continues on various components of the definition and its conditions. While constituting one of the foundations of western philosophical tradition, the foundational debates of epistemology do little to illuminate the analysis of the evolution of encyclopedic knowledge. For the current analysis, the relevant approach is revealed to be not the philosophy, but the sociology, of knowledge.

Originating with the emergence of sociology as an independent mode of inquiry, the sociology of knowledge focuses on the "relationship of knowledge to a social base"

("Sociology of Knowledge"). While most of the notable figures in the early history of sociology, such as Durkheim, Weber and Marx, included knowledge within their overarching theories, philosophers, most notably Michel Foucault, made the most relevant contributions to the discipline in the 20th century. By focusing on the evolution of some of the fundamental institutions of Western civilizations, namely the asylum, the hospital and the prison, Foucault demonstrated "the major shifts in the discourses through which such topics become constituted: to show how new 'regimes of truth' order our knowledge, our categorization systems, our beliefs, and our practices" ("Foucault, Michel").

Foucault's 1969 volume *Archeology of Knowledge* is primarily concerned with the formation, propagation and sustainability of discursive systems and their inherent claims to concepts like truth and knowledge. According to Foucault, "there is no knowledge without a particular discursive practice; any discursive practice may be defined by the knowledge that it forms" (183).

Following closely on Foucault's detailed analysis of the formation and maintenance of systems of knowledge in societies, Jean-François Lyotard published his *Report on Knowledge*, entitled *The Postmodern Condition* (1979). Lyotard argues that the modern condition was defined by science producing a discourse of legitimation with respect to its own status, called philosophy (xxiii). In contrast, Lyotard argues that "the status of knowledge is altered as societies enter what is known as the postindustrial age and cultures enter what is known as the postmodern age" (3). According to Lyotard, one of the key transformations behind the transition to the postmodern age is the proliferation of computers and the establishment of "a certain logic and therefore a certain set of prescriptions determining which statements are accepted as 'knowledge statements'" (4). Lyotard terms the resulting state as postmodern, defined by an "incredulity toward metanarratives" (xxiv). The chief effect of this transition will be observed "through exteriorization of knowledge with respect to the 'knower', with the effect that knowledge itself will cease to be an end in itself, becoming a commodity, devoid of 'use-value'" (4). While the evaluation of the specifics of the future Lyotard foresaw for knowledge in postmodern societies falls outside the scope of this study, my analysis of the history of encyclopedias will show that his observation regarding the externalization of knowledge

from the 'knower' is accurate, if only as a general trend over many centuries and not as a sudden change brought on by the proliferation of computers.

Developing in close proximity to various branches of philosophy and sociology, the burgeoning field of media studies has also produced works by a number of scholars who have advanced the project of chronicling the evolution of the understanding of knowledge throughout history. Elizabeth Eisenstein, whose landmark study of the printing press was discussed earlier, along with other similarly focused scholars, can be considered as belonging to this tradition. Similarly relevant is Peter Burke's 2000 volume entitled *A Social History of Knowledge*, which illustrates the evolution of modern institutions that create and assess knowledge, such as the university and the research institute, while providing an account of the emergence of the modern scientific method. In this regard, Burke argues that the "18th century marks a turning point in the history of European knowledge in a number of respects" (44). He illustrates some of the changes as following:

> The virtual monopoly of higher education enjoyed by the universities was challenged at this time. In the second place we see the rise of the research institute, the professional researcher and indeed of the very idea of 'research'. In the third place, the clerisy, especially in France, were more deeply involved than ever before with projects for economic, social and political reform - in other words, with the Enlightenment. (ibid)

Burke also notes the cyclic nature of this evolution: "In Europe, these cycles are visible from the 12th century, when new institutions called universities replaced monasteries as centers of learning, to the present. The creative, marginal and informal groups of one period regularly turn into the formal, mainstream and conservative organizations of the next generation" (49).

In a similar effort, Steven Shapin, in his 1994 volume *A Social History of Truth*, chronicles the evolution of the modern understanding of scientific knowledge through its emergence in 17th Century English society. Shapin argues that while the modern culture surrounding scientific knowledge builds upon skepticism, as "this new culture emerged partly through the purposeful relocation of the conventions, codes, and values of gentlemanly conversation into the domain of natural philosophy" (xviii). Echoing

Foucault's placement of knowledge within construct of the discursive formation, Shapin notes:

> Knowledge is the result of the community's evaluations and actions, and it is entrenched through the integration of claims about the world into the community's institutionalized behavior. Since the acts of knowledge making and knowledge protecting capture so much of communal life, communities may be effectively described through their economies of truth. (6)

Regarding the history of scientific knowledge, Shapin argues that in order to address the mounting issue of trust among the newly developing scientific community, the codes and norms of gentlemanly society were "transported into the new practice of empirical science to act as a local resolution of a pervasive problem about the grounds and adequacy of knowledge" (42). According to Shapin, the practitioners of this modern, fledgling community of natural science enlisted their highly refined sense of decorum to address issues of personal trust and to adjust it appropriately, based on the presumption that they were all part of the gentle society, and being a "trustworthy or credible person" was a fundamental prerequisite of being a gentleman. While such a basis for individual or institutional trust might seem a scant basis for modern practitioners of science, Shapin argues to the contrary:

> The reason that neither legal nor scientific practitioners spelled out the grounds of credibility or the identity of a credible person was that they had no need to do so. Cultural silence about the identification of the credible person was not a sign of ignorance but of immense knowledgeability. Participants 'just knew' who a credible person was. They belonged to a culture that pointed to a gentleman as among their society's most reliable truth-tellers, a culture that associated gentility, integrity, and credibility [...] They understood and appreciated the local consequences of disputing that culture and those entitlements. (241, 242)

As Shapin concludes, the growth of the scientific community and the maturation of their practices resulted in a shift from interpersonal relationships to institutions that are primarily dedicated to fostering and maintaining the conditions of credibility and trust.

Whether analyzed through a Foucauldian analysis of discourse, or simply read as a detailed history, it is clearly evident that the content of knowledge and other related concepts were recast during the emergence of modern societies. The role of the proliferation of the printing press in the transformative events and movements from 16th century

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onwards has been likewise discussed in detail in this thesis. The accompanying changes in institutions and the standards they enforced has determined the modern understanding of knowledge, while the scientific method came to prescribe the ideal path for achieving it. While the societies that created them were facing such fundamental changes, encyclopedia compilers were updating their works accordingly, their efforts invariably producing pristine examples of what knowledge meant in any given century.

4.2.2 Treatises, Mirrors and Trees

The notion that the origin of encyclopedic thinking can be traced back to the emergence of Western philosophy is not insignificant. Throughout their history, encyclopedias have served as testing grounds and showcases for different approaches to knowledge. However, the relationship between encyclopedias and branching knowledge has seldom been straightforward. Indeed, the very first instance of the encyclopedic ideal in a recorded form also marks the first recorded instance of skepticism toward the effects of communication media. While founding both western philosophy and the encyclopedia, Plato equally recorded his apprehension towards the very tools he was using. His opinion of writing is expressed most clearly in *Phaedrus*:

> For this discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves. The specific which you have discovered is an aid not to memory, but to reminiscence, and you give your disciples not truth, but only the semblance of truth; they will be hearers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality.

While Plato's writings, however ambivalent he was towards them, constitute his long-term legacy, the intended mission of his *enkyklios paideia*, embodied within the Academy, was altogether different. The purpose of the academy was to provide the all-encompassing knowledge required for the contemporary Greek citizen to be competently active in the affairs of the *polis*. While Plato's dialogues covered various subjects, the primary purpose behind his written output seems to be to share the method with which one should arrive at knowledge, and not to present merely facts, a practice he regarded as a crutch for the mind.

It is a testament to the pervasive power of the phonetic alphabet that within one generation, Plato's most prominent student was already producing works primarily intended to be read as freestanding treatises on individual subjects. By providing the categories with which to perceive the world, and aiming to treat them individually, Aristotle's writings essentially compromised a portable *enkyklios paideia*, a university contained within the recesses of scrolls.

A similar logic can be observed in the work of great Roman encyclopedists like Cassiodorus and Pliny, even though their primary role had already shifted from composition to compilation. As they recorded their observations and compiled sources, they were constantly aware of the general scheme within which individual contributions fit. Moreover, at this point of origin, the modern distinction between the author and the editor was non-existent and the act of compiling an encyclopedia can be considered to be an exercise in philosophy itself.

The longevity of Pliny's influence over his successors, which covers an unfathomable stretch of sixteen centuries, is a testament to the defining nature of his efforts. As illustrated earlier, a large part of the influence Pliny and his contemporaries exerted over the medieval encyclopedic compilers is related to their understanding of knowledge. While Aristotle's categories had a fundamental effect on the organization of later compilations, the encyclopedists of the Antiquity were responsible for establishing and abiding inherent trust in the written word and therefore how they defined true knowledge.

This subtle shift in the position of the encyclopedia and its role within the greater transformation of knowledge during the Middle Ages is also evident in the titles that compilers of these works deemed appropriate. To complement the *Book of God*, the encyclopedists of Medieval Europe aspired to hold up a great mirror to reflect creation. Best illustrated through Vincent de Beauvais's famous compilation *Speculum Maius*, "the great mirror", of 1244. In contrast, a collection of treatises such as Pliny's *Historia Naturalis* implied the nature of an explorer charting new knowledge, so that the medieval encyclopedia was metaphorically organized around the possibility of completeness, reflected in a big enough mirror. However, it is important to note that while such metaphors, like the mirror, might allude to the organizational structure of an encyclopedia, their purpose was to

illustrate the understanding of knowledge as employed by the compiler rather than to provide navigational aide to the user or demonstrate how the encyclopedia was actually laid out. The disconnect between the metaphor employed to illustrate the understanding of knowledge and the actual organizational principles of the encyclopedia became even more pronounced later when the adoption of the tree of knowledge coincided with alphabetical ordering of articles.

As this shift in metaphors suggest, the most significant change from Antiquity to the Middle Ages concerns the source of the knowledge base being compiled. While the initial origin of the encyclopedic ideal is rooted in the creation of new knowledge and the ways in which one should conduct an inquiry that produces new knowledge, the role of the encyclopedist very quickly evolved into that of compiler and editor. Hence, it is clear that medieval followers of Pliny and Cassidorius embraced the role of keepers of knowledge as opposed to that of inquiring philosophers, even though the modern distinction between author and editor were foreign concepts at the time. This evolution also conforms to the observation made by Ong, that the proliferation of literacy within a culture signifies a separation of the knowledge from the knower.

When the assumptions of medieval knowledge were challenged during the Enlightenment and the encyclopedia realized its potential to be subversive, as outlined by McArthur, the individuals behind these revolutionary works exercised their editorial power to highlight the new knowledge and its creators, most famously in the case of Diderot and the *Encyclopédie*. While the emergence of the modern encyclopedia over the course of the Enlightenment, along with the scientific method, redefined most of the conventions established during the Middle Ages, the editorial function of the compiler remained, albeit with shifted priorities.

The *Encyclopédie* symbolized the close relationship between the Enlightenment and the modern encyclopedia, but Diderot and d'Alembert's monumental efforts were the most visible incarnation of a general trend. Rajan, in his article "The Encyclopedia and the University of Theory" notes that "the Enlightenment is often described as 'the age of the encyclopedia'" (335). Explaining the major changes heralded by the Enlightenment, Rajan argues that "In the Middle Ages and Renaissance, the encyclopedia's archive fever, its

multiplication of areas of knowledge and thus fragmentation of Knowledge (with a capital K) was held in check by the trope of the book as mirror of creation. The long eighteenth century, however, witnessed several new encyclopedic enterprises connected with the constitution of modernity…" (ibid.). Based on Bacon's proposal to acquire new knowledge, the compilers of early-modern encyclopedias, like Chambers, sought new sources while restructuring their notions concerning under which conditions knowledge can be considered reliable and valid.

One of the most visible signs of this shift was the adoption of the tree of knowledge as the representing metaphor of the knowledge landscape. Advocated by Bacon, the tree of knowledge was later adopted by *Cyclopédia* and the *Encyclopédie,* both works aiming to illustrate modern disciplines and how they interact. At the same time both works also embraced the newly emerging concept of scientific expertise. Chambers has acknowledged the newly developing scientific community as the basis of his groundbreaking work when challenged, while Diderot and d'Alembert boasted the fact that each topic was written by an expert in their field. Following in the footsteps of these pioneering works, *Britannica* later embraced the expertise of its contributors as a key selling point.

The shift from copying trusted sources from the Antiquity and previous compilations to reliance upon expertise of specialists represent another step in the separation of the knowledge and its creator. The medieval compilers trusted their precursors and the established names of Aristotle and Pliny. For the modern editor-in-chief, such names increasingly meant less as their importance was replaced by the institutional titles granting topical expertise to individuals. The gradual emergence and evolution of the accreditation system, along with modern science, was covered earlier in this chapter and its sophistication increased along with the complexity of the newly accumulated knowledge.

The emergence of the modern encyclopedia also marks the adoption of the alphabetical ordering of articles and while the consequences of this shift will be analyzed during my discussion of organizing principles, according to Rajan the shift also had implications concerning knowledge: "this form reduced the encyclopedia to a secondary reference system that stored rather than synthesized knowledge, and thus inscribed a conception of knowledge as information or technology rather than philosophy" (335).

Rajan's argument further illustrates the increasing separation of knowledge from its creators and compilers.

While this democratization among fields of knowledge that stem from the alphabetical categorization of articles allowed Diderot to diffuse his subversive ideas throughout the entirety of his *Encyclopédie*, this organizational scheme also implied that the encyclopedia was no longer meant to be read from cover to cover, with implications regarding the body of knowledge contained within. The emergence of the modern encyclopedia dispelled the ideal that an individual can absorb the entirety of its contents. However, while rendering the polymath obsolete, "in the longer term, [the] parceling of knowledge into alphabetized entries done by separate hands lays the grounds for an instrumentalizing and contracting out of knowledge, and for current (social) scientific models of collaborative research" (Rajan, 339). This close interconnecting relationship between the organizational scheme and understanding of knowledge points to the interlocking nature of the three concepts under investigation in this study and will resurface during the rest of this chapter.

Taken as a whole, the continuous evolution of the encyclopedic form, from Antiquity to modern industrial society, can be regarded as a gradual yet constant distancing of the compiler and the basis of knowledge to be included in the compilation. The history I have been tracing then, covers the movement of what started as a collection of general principles on life, and essays on diverse subjects by pioneering philosophers, that very quickly evolved into compilations contributed by various authors. The medieval compilers, certain in their conviction regarding the authority of their sources, took on the mission to preserve and collate these texts. When the *philosophes* of the Enlightenment rebelled against these established norms, they instituted the modern understanding of science and expertise. The encyclopedias of the Enlightenment pioneered the validation of these sources of knowledge and authority. During the 19th century, owners of *Britannica* institutionalized this process of creating an encyclopedia and honed its financial viability by rendering these values as the core of a prestigious brand. Following this trajectory then, it is noteworthy, although not surprising, that the intricate relationship between the evolving form of the

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encyclopedia and the continuously changing media landscape, closely correspond to each epoch of the evolution of the notion of encyclopedic knowledge.

Hilary Clark, in a 1992 paper titled "Encyclopedic Discourse," identifies within the encyclopedic enterprise both totalizing tendencies as well as an impulse towards discontinuous and fragmented forms (1992, 95). According to Clarke, this duality originates from the urge to compile the entirety of human knowledge, while striving to arrive at a definitive system of categorization. Alternatively, while the encyclopedia strives to expand its coverage, it also seeks to *encircle* it (96). After noting this duality, Clarke goes on to argue that, following Foucault's notion of "discourse", the encyclopedia can be considered as discourse *par excellence* (108). According to Clarke:

> In the encyclopedia, we are looking at a special type of discourse. Like any discourse, it selects from a range of material on a subject and arranges its selections in order to inform or persuade. Yet it is special in that it selects from the entire domain of human knowledge, arranging its selections according to specific orders--thematic and encyclopedic--that have developed historically, and representing its own discursive process in tropes such as the mirror, the tree, the labyrinth, the circle, and the network. (98)

What this quotation from Clark, and the argument I have been sketching thus far imply is that the history of the encyclopedia in Western Europe contains the history of knowledge. Since the invention of the phonetic alphabet, encyclopedias have been the repository for not only the collective knowledge of each epoch but also for the methods and the underlying assumptions behind those knowledge systems. The roles attributed to individuals responsible for the encyclopedia have been refined over the ages, crystallizing with the modern title of editor-in-chief who commissions articles from properly accredited experts. This analysis, and the earlier historical survey, has demonstrated the historicity of the prestigious position of editor-in-chief along with its accompanying assumptions regarding knowledge. The rise to prominence of the editor-in-chief also illustrates how such functions have become integral parts of the wider society and the prevalent media ecology. While this historical survey has been my focus thus far in this chapter, the next section of this analysis will elaborate on the particulars of *Wikipedia* and evaluate how the volunteer community of

editors writing the largest encyclopedia ever compiled redefine or sustain norms regarding knowledge.

4.2.3 Building Consensus

When the founders of *Wikipedia* set out to open the process of article creation to volunteers, they were forced to supplement all the established mechanisms for ensuring the reliability and verifiability of an encyclopedia. The previous section discussed the evolution of these mechanisms and, illustrated their historicity. However, these principles have come to define the standard by which the modern encyclopedia defined itself for over two centuries and are very well established. This long history, coupled with their widespread adoption resulted in deeply held beliefs on the part of editors as well as readers and subscribers. Given no reliable access to expert knowledge in the traditional manner, *Wikipedia* founders adopted the process of creating an encyclopedia according to the strengths of the tools they were deploying, without compromising the ultimate goals of what an encyclopedia is expected to accomplish. In this sense, the approaches adapted by early *Wikipedia*ns were no more radical than the medieval scribes striving to preserve their beloved books. However, this compromise has led to one of the most overlooked and misunderstood tenets of *Wikipedia*, namely that the basis of inclusion is not truth, but verifiability ("*Wikipedia*: Verifiability, Not Truth").

The page on the *Wikipedia* website that describes the policy states that the threshold for inclusion in *Wikipedia* requires that all material "have been published previously by a reliable source" (ibid). While combined with other core content policies such as Neutral Point of View and No Original Research, the policy is consistent with the rest of *Wikipedia*'s stance, yet it nevertheless leads to interesting questions intellectually, while creating occasional confusion on a day to day basis, especially for new editors uninitiated into the inner workings of *Wikipedia*.

The most visible problem with the above definition is arguably the allusion to "reliable sources". While the topic might seem deeply ideological and rife with political preferences, the motivations exhibited on the relevant page detailing this definition is

primarily pragmatic and, as with most other policies and guidelines, negotiable within the community ("*Wikipedia*: Verifiability"). However, this implied flexibility has, by no means, diminished the potential for conflict or confusion. One of the most common problems resulting from this policy concerns the use of *Wikipedia* by mass media outlets. When an inaccurate article without external sources is used by a publication without acknowledgement, this publication itself usually ends up at a later date as the verified source for the article, perpetuating the false information. The phenomenon is perfectly illustrated by the famous Web Comic XKCD (Munroe, 2011):
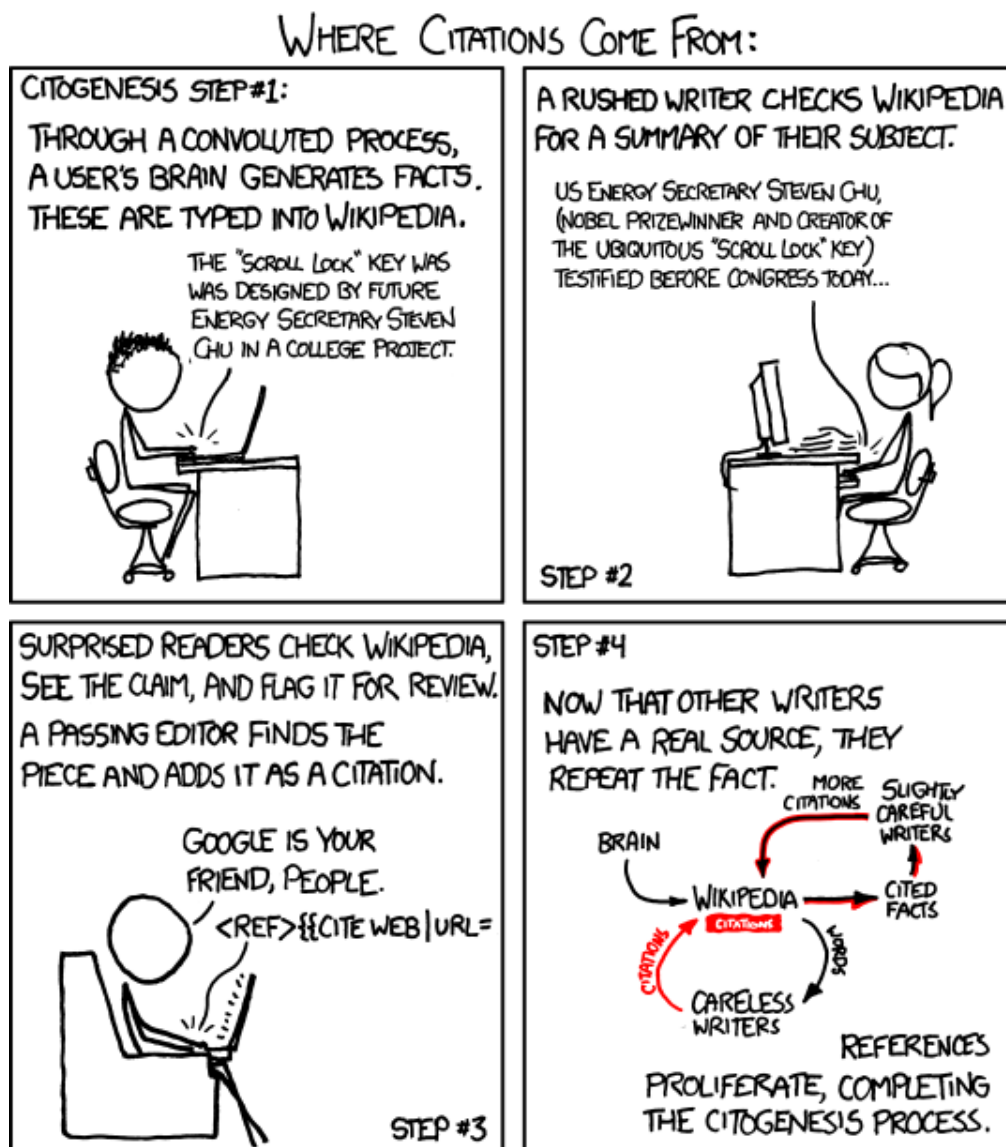

Figure 7 "Where Citations Come From", XKCD, Munroe, 2011

While this issue goes unnoticed by the millions of readers consulting *Wikipedia* on a daily basis, it has genuine implications regarding the transformation that *Wikipedia* represents for encyclopedic knowledge. In my earlier discussion of *Wikipedia*, I discussed the model of consensus that guides the article creation process and the central importance of Neutral Point of View. All factors combined, the model that has evolved in various iterations over the years into *Wikipedia* has resulted in a system that aims to preserve the core of the previous incarnations of the encyclopedia, while attempting to compensate for its shortcomings with the unique affordances of its platform.

In the previous section I illustrated the relationship between the evolving shape of the encyclopedia and transformations in the ways that knowledge is defined and produced. Beginning with complete deferral to individual philosophers and authors, encyclopedias kept up with the emergence of systems of knowledge structures. The medieval scribes combined their desire to save ancient texts with the worldview of Christian Theology, and therefore aspired to hold up a mirror to divine creation. The modern encyclopedia, born with the Enlightenment and with the modern scientific method, quickly adapted to epistemological shifts and began basing its claim to true knowledge on the institutions that defined expertise.

It is noteworthy that each of these eras was punctuated by the adoption and proliferation of new technologies that led to problematic results in the early stages of adoption. For example, Plato's troubled relationship with writing itself is well documented and has been discussed elsewhere in this study. Likewise, following the widespread adoption of the printing press, the compiler of one of the first modern encyclopedias, Ephraim Chambers, was faced with a lawsuit claiming that his *Cyclopaedia* constituted intellectual theft. Chambers successfully argued that the act of compilation rendered his work original and the sources he used transcended mere copies and therefore became parts of a new work.

In the case of *Wikipedia*, both the general issues I have highlighted in my earlier chapter, as well as the particular challenges its model represents concerning knowledge, point to a similar pattern of adaptation and soul-searching. While trying to redefine the condition with which *Wikipedia* defines knowledge, the project's editors are offering the unique strengths of their medium as a compensation for the lack of institutional support

that previous generations of encyclopedias relied upon. While the transparency of the article creation process and the ability to see through every individual edit might depend on the personal affinity of individual users, this only highlights the fact that *Wikipedia*, as a representative of changing notions regarding knowledge on the global Internet, requires a new type of literacy. Just as, for example, the adoption of the printing press was instrumental in standardizing national languages while speeding the production of the encyclopedia, benefitting from the unique affordances of *Wikipedia* and all the while meeting its new challenges might require a broader shift than any one modification the community might make to individual guidelines or policies. While the exact discussion of the content of this shift in educational approach towards acquiring and verifying knowledge would fall outside of the scope of this study, when analyzed through the historical evolution of the form, change seems inevitable.

Accompanying this shift in understanding of and assumption concerning knowledge is the fundamental recasting of the author function and his or her attributed authority. The next section will analyze this issue in detail.

4.3 Authors and Authority

4.3.1 Authoring Authority

While in the previous section I discussed the evolution of encyclopedic claims to knowledge and understanding of truth and validity through Antiquity to the Middle Ages and the Enlightenment, in this section I will follow this same historical path with the goal of discussing more specifically the role of authorship. On a fundamental level, the evolution of authorship within the context of an encyclopedia is more directly linked to conceptions regarding sources of authority, rather than to the emergence of the author figure in literature and other artistic fields. While the literary and philosophical study of the author function may be applied to both instances, the following analysis of authorship will still be informed primarily by an encircling discussion of knowledge and the organizational influence of media. While the evolution of the encyclopedic form has been closely

integrated with the changing definitions of knowledge throughout the centuries, the formation and rise of the modern author has had a relatively limited effect on the compilation of encyclopedias, mainly because most of the authority figures associated with encyclopedic works have primarily assumed the role of the compiler. However, even investigating the emergence of the distinction between these two roles is a valuable exercise in itself.

During the discussion of the proliferation of the printing press, notable scholars on the subject such as Eisenstein and MacArthur were quoted with the argument that the emergence of concepts of authorship and audience can be traced back to the impact of print. For example, the increased reach and availability of books in the 18th century, for the first time in history, made it possible for an author to experience the reaction to his or her work from a wide and diverse audience. While not strictly related to the production of encyclopedias, this reinforcement of the individual author figure as the creator of original literary content became only more pronounced through the Enlightenment and over the following centuries, finding strong expressions in the Romantic movement in the 19th century. Arguably the most visible effects of the heightened sense of the role the author in the world of encyclopedias was the famous 9th edition of the *Britannica*, published in 1889, widely known as the "scholars' edition" which boasted famous contributors like Thomas Huxley and Robert Louis Stevenson and many other scientific and literary luminaries of the time.

Developing alongside a growing awareness of the influences of particular communication media, a number of literary scholars have questioned the validity of the traditional author figure as it was established since invention of the printing press and the Enlightenment. In his seminal 1967 essay "The Death of the Author", Roland Barthes argued against the established tradition in literary studies of analyzing a work through the larger considerations of the identity of its author, and called for a multifaceted analysis that is more perceptive to the many layers in the production of literature that make up every text (Barthes, 2001). Barthes argued that every text "is a tissue of quotations drawn from the innumerable centers of culture", therefore rejecting the ideal of a definitive meaning of a text (1468).

In his 1969 essay "What is an Author?" Michel Foucault also questioned the components of the identity and the function of the author figure in literature. Foucault starts his analysis by identifying the functional attributes of the authorial identity as indicating "relationships of homogeneity, filiation, reciprocal explanation, authentification, or of common utilization" among texts that are attached through their author (Foucault, 2001, 1627). In this sense, according to Foucault, the name of an author serves primarily as an aid to classify groups of texts and consequently, functions to "characterize the existence, circulation, and operation of certain discourses within a society" (1628). Later, turning his attention to the historicity of the concept, Foucault demonstrates that "certain types of texts have not always required authors" (ibid.). In the case of what has come to be called scientific knowledge, Foucault argues that, during the Middle Ages, the name of the author attached to a text was its main claim to authority, however, with the emergence of the scientific method, this claim has moved on to the text itself.

> In the 17th and 18th centuries a totally new conception was developed when scientific texts were accepted on their own merits and positioned within an anonymous and coherent system of established truths and methods of verification. Authentification no longer required reference to the individual who had produced them; the role of the author disappeared as an index of truthfulness and, where it remained as an inventor's name, it was merely to denote a specific theorem or preposition, a strange effect, a property, a body, a group of elements, or pathological syndrome. (Foucault, 2001, 1629)

Foucault argues, in conclusion to his analysis, that the author function is "undoubtedly only one of possible specifications of the subject and, considering past historical transformations, it appears that the form, the complexity, and even the existence of this function are far from immutable" (1636). Foucault's essay is very significant in highlighting the historicity of the author function and thus providing a theoretical framework for its evaluation throughout the history of the encyclopedia.

Following these groundbreaking essays, along with the increasing prevalence of historical studies on the impact of various technologies of writing, chief among which is the printing press, the evolution of the role of the author function as identified by Foucault continues to be an active field of study. In his 1994 investigation into the nature of authorship, Ross highlighted the difference between someone who has the ability to write, a

scribbler, and someone who is given the title of author, arguing that the distinction is socio-historical, and "based on the technology of invention and the politics of intervention" (231). Highlighting the practice of medieval scribes of rendering their manuscripts as legible as possible through highly stylized typographic techniques, Ross argues that such practices are "a political act; the act of claiming or declaiming a culture's authorities", in the sense that, "the legibility, the readable uniformity of their scribbling acknowledges that handwriting is a technology invented to stabilize meaning" (232). Ross goes on to argue that this relationship between the stylized, uniform script and authority is reversed with the proliferation of the printing press: "Originally, to be an authority is to be scripted. But with time, to be printed is to be an authority" (236). Ross argues, in line with others historians I have quoted earlier, that the development and implementation of modern licensing and copyright schemes were an effort to control what was a newly emerging form of authority that is attributed to printed material (242). However, Ross further argues that, despite their ever increasing complexity and coverage, these regimes could never replicate the control exercised by the Church over the production of manuscripts because "the waywardness of scribbling can always find ways of manipulating the uniformity of print. Once print supplants manuscript, it does not purge that waywardness, but rather authorizes it" (247).

Also challenging the idea of the solitary author as the singular creator of individual works, Harold Love argues that authors produce "texts through complex processes of adaptation and transformation" (2002, 32). Love notes that "attribution studies attempt to distinguish the traces of agency that cohere in pieces of writing, sometimes discovering one singular trace, but often a subtle entanglement of several or many" (32). In order to better accommodate this inherent complexity embedded in the idea of authorship, Love argues the need for a more nuanced model of "authorship, not as a single essence or non-essence but as a repertoire of practices, techniques and functions--forms of work--whose nature has varied considerably across the centuries and which may well in any given case have been performed by separate individuals" (33). Love also highlights the evolution of collaborative authoring, giving it the very useful definition of "a series of functions performed during the creation of the work rather than as a single, coherent activity" (39).

The concept of authorship and the implicit authority frequently attached to it has evolved considerably since the invention of writing and through changes in dominant communication media. Indeed, much of the literary theory written in the 20th century was committed to uncovering and understanding the historicity of the concept of authorship and to analyzing the conditions and effects of its evolution. The encyclopedia, as a form of writing that can trace its evolution throughout the entirety of this history, presents a very rich and interesting case study of the author function. In the following section, I will present an analysis of the evolution of the author function as it relates to the implied authority of encyclopedias through ages.

4.3.2 Philosophers, Monks and Editors

In the previous section I outlined the evolution of the role of the author figure along with the evolution of the implied authority attributed to the title of author. Through such a historical survey, authorship emerges as a concept influenced by social and political conditions and shaped by the technological limitations of any given time period. While neither the modern encyclopedia nor *Wikipedia* is considered to be an expression of the author function in the romantic sense, that is the expression of a homogenous subjective presence, the history of the encyclopedic form nevertheless follows the historical trajectory outlined above.

The earliest recorded philosophical inquiries that formed the basis of encyclopedic thought defined the author function as well as it defined the understanding of knowledge. In the following centuries, the scarcity of newly written material and institutions that encouraged the collection of new facts, bestowed upon these ancient texts unquestioned reverence and authority. The mode of production of books before the invention of the printing press compounded and contributed to these social and political factors. This is to say that, as long as the production of books was a laborious and time-consuming process, the mere fact that a certain book was chosen for reproduction implied an inherent significance of the work in question that only grew over centuries.

As Foucault illustrated, during the pre-Modern era, the name of the compiler attached to the encyclopedia was the very mark of authority for its contents. While the modern scientific practice of attribution and citation is a method of identification and classification, the medieval text derived its authority through the name of the author it was associated with. This practice clearly explains the habit of associating pre-Modern encyclopedias with the name of their compilers, even though most of these texts were as much a collection of disparate authors as any edition of the *Encyclopaedia Britannica*.

In my analysis of the evolution of the bases of knowledge over time, I quoted Shapin's study regarding the emergence and evolution of the modern scientific community. In his study, Shapin argued that the community of scientific pioneers of 18th-century England adopted the socially implicit rules of conduct that governed their daily lives such as the norms of gentlemanly behavior, into signifiers of trust and verifiability. In the context of authorship and authority, Shapin's argument suggests similar lines of development both with Foucault's analysis and my historical overview of the history of encyclopedias.

The earliest examples of modern encyclopedias that emerged after Bacon's call for new facts during 17th and 18th centuries all came to be recognized through their compilers, such as Moreri, Harris, Chambers and most famously, Diderot and d'Alembert. As these works aspired to be in line with the new principles regarding knowledge and scientific authority, this personal association can be attributed to their transitional nature, in line with Shapin's arguments, between the medieval compilations and the modern, institutionalized encyclopedic sets. It is remarkable that within less than a century the leading encyclopedia became known primarily by its name, *Encyclopaedia Britannica*, and not by that of its editor-in-chief. During the intervening time between the publication of the *Encyclopédie* and the *Britannica*, modern scientific principles were disseminated throughout Europe and transformed the basis of authority.

Along with the transformation of the basis of knowledge that occurred as a result of the Enlightenment and the Scientific Revolution, the implied authority of a certain work transferred from the individual recognized to be the creator of the work to external institutions and mechanisms that were designed on the principles of impartiality and objectivity. Modern scientific practices such as peer-review emerged to guarantee the

verifiability of scientific publications and institutions such as universities redefined their role as arbiters of expertise in all the newly developing areas of knowledge. Adapting to this new climate, the editors of *Britannica* along with other contemporary encyclopedias increasingly highlighted the academic credentials and other intellectual merits of their contributors, such as the number of Nobel Prize winners among their contributors, and the individual traits of the editor-in-chief.

A closer analysis of the authorship practices implied within encyclopedias over centuries also reveals a clear path of evolution along the lines recognized by literary historians concerning literature and scientific writing as a whole. Starting with leading philosophers, encyclopedias developed based on the authority of notable intellectuals, as the reputation of their names were commonly recognized and identifiable as sources of authority. Along with the emergence of modern scientific model, following a transition period, the authority implied in encyclopedic writing transferred the basis of its claim to the affinity with institutions of science, such as universities. It is evident that encyclopedia presents an accurate depiction of the source of authority and the current regime of the author function over centuries. In the following section, I will analyze the author function as it can be observed in *Wikipedia*.

4.3.3 From Anons to Zealots with Barnstars

When Larry Sanger proposed trying out wikis to foster article creation for the struggling *Nupedia* project in 2001, the few accredited contributors working within the strictly established parameters of *Nupedia* found the prospect problematic. Their unease with the open nature of *Wikipedia* relates to the challenges that the project poses to the established author function and the authority implied in all modern encyclopedias. A closer look at the authorship practices of *Wikipedia* reveals that it is completely different from the encyclopedias it replaced in the daily lives of most people. In this section, I will present an analysis of these differences and consider some of the possible consequences and implications of this transition. Previously, I discussed the technological foundations and key

principles that define *Wikipedia*, however, the collaborative authorship practices that lie at the center of its content creation process require further elaboration.

The study of collaborative authorship dates back to a time before the popularization of *Wikipedia* and other projects adopting the Wiki technology. A number of studies have aimed at establishing ideal conditions for the most effective collaboration practices while others have strived to identify behavioral patterns and to understand the inherent social dynamics among a group of collaborators. In her 1993 essay, Amy Shuman recognizes the complex social and political dimensions involved in any analysis of literacy and authorship, and argues that the collaborative nature of a text does not, in itself, guarantee any degree of neutrality (Shuman, 265). However, collaboration itself in writing has undergone a transition with the introduction of ubiquitous networked computers and specialized software platforms of which Wikis are just one example.

Addressing the challenges posed by the new medium, Nora Miller argued in a 2005 article that the established legal and educational systems based on the idea of a definitive author associated with individual works is being subverted by the affordances of the Internet (39). Echoing earlier work on the potential of hypertext, Miller cites the interactive nature of online communication where a reader can become an editor and a writer through inserting comments or responding just as easily as on a similar platform (39). In the context of *Wikipedia*, Miller argues that names associated with individual edits are recorded and highlighted not "to assert authorship per se. Rather, other readers use it to determine whether a page has changed since they last viewed it, or to discover the identity of a writer who perhaps introduced an error or a spurious comment" (40).

In *Wikipedia*, while main article pages do not carry any names associated with them, as every single edit is individually stored in the system, anyone can trace the evolution of an article and observe which changes were made by which user or, in some cases, which I.P. address in the case of anonymous edits colloquially known as "anons". Every registered user of *Wikipedia* is assigned a homepage where their activity can be observed by their peers and visitors. Also, the community has implemented merit badges, or "barnstars" as they are called in the community, to mark the significant contributions and milestones in a user's history of activity. These and other methods are aimed at fostering a sense of achievement,

and encouraging feelings of belonging within the community and ultimately at increasing the retention of editors.

Given the popularity of *Wikipedia* as a resource and the growth and complexity of its community, there have been numerous studies devoted to the authorship practices of *Wikipedia*. In a 2005 study by Emigh and Herring, the authors argue that the open and collaborative editing of *Wikipedia* entries provides content that is "largely indistinguishable stylistically from expert created" sources (9). The authors identify the rationale for this consistency in the social structure of *Wikipedia* and propose two distinct forces at work (ibid):

i. *Wikipedia* users appropriate norms and expectations about what an encyclopedia should be, including norms of formality, neutrality, and consistency, from the larger culture.
ii. These norms are enforced through the agency of dedicated, socially- approved members of the *Wikipedia* community.

Emigh and Herring also argue that the ease of editing afforded by Wiki software, which allows for incremental improvements in styling and formatting, is also a contributing factor in the formal structure and presentation of articles. According to the authors, editors who are most comfortable with using the open tools provided by the Wiki software are usually the ones who are responsible for the greatest amount of work directed at the standardization of articles (1).

In a study aiming to determine the characteristics of editors who are responsible for high quality contributions, authors Anthony et al. identify two types of contributors common to open source projects and other open, collaborative content creation platforms. Contributors associated with the first type, the "zealots", are members who devote large amounts of their time and effort to the project and who are deeply committed to its goals, the second type of contributors, the "good Samaritans", make occasional contributions as they are motivated to edit an article upon noticing a deficiency which they consider themselves to be particularly well-equipped to address (2005). The authors define high quality contributions as individual edits with high retention rates. It is noteworthy to point out that the authors of the study do not claim to be able to take the actual quality of the

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contributions into consideration and, therefore, do not make qualitative judgments. The metric is based on the proposition that a high-quality contribution would be more likely to remain on the site without being reverted or subjected to further edits. While, with the authors' admission, this metric overlooks many aspects of *Wikipedia*'s content creation process (ignored articles, edit wars and so on), their results are still helpful in identifying certain patterns. According to Anthony and his colleagues, registered users with greater experience tend to create higher quality edits whereas highest quality contributions from anonymous users are made by inexperienced editors (16). Overall, the authors argue that the model represented by *Wikipedia* challenges conventional expectations regarding contributions to collaborative projects:

> Open source production alters the *quantity* of producers, which in turn affects the *quality* of the production process itself. Our findings that one-time, anonymous Good Samaritans, as well as committed experts, contribute high quality content to *Wikipedia* suggest that open source production enables the exploitation of untapped productive resources that overcome barriers to efficient production of collective goods. (20)

While the collaborative writing space of *Wikipedia* fosters an open and flexible flow for the creation of its encyclopedic content, the myriad of policies and guidelines are essential in channeling the efforts of its contributors in the most effective manner, according to the goals of the project. While the myriad policies and guidelines of *Wikipedia* constitute the core of its identity and provide a formative role for its editors, they also serve as shorthand and common ground in discussions within the community. In fact, being able to cite policies and guidelines adeptly is an acquired skill among seasoned editors while over-reliance on policies to prove a point or being overzealous in their application has its own pejorative name, "Wikilawyering" ("*Wikipedia*: Wikilawyering").

In a 2008 study by Beschastnikh et al., the authors investigated such citation practices employed by contributors within the context of various discussions and found that the policies play a very important role in the self-governance of the community (1). The study notes the essential role of citing policies as the connection between the overall goals and principles of the project and the day-to-day activities of it editors, and argues that the practice is very common among both new and veteran users (ibid.). The authors also argue

that being able to communicate through shared guidelines is essential in creating an inclusive community. The finding of this study also corroborates another study I have mentioned by Bryant during my initial discussion of *Wikipedia* where she identified *Wikipedia* as a "community of practice", defined by three tenets (2005):

i. Members are mutually engaged.
ii. Members actively negotiate the nature of the enterprise.
iii. They have a collective repertoire of negotiable resources.

In a 2008 attempt to identify the practices that produce the highest quality articles, Jones investigated the differences in patterns of revision between *Wikipedia*'s Featured Articles and articles that were nominated for Featured status but were subsequently rejected. According to *Wikipedia* :

> Featured content represents the best that *Wikipedia* has to offer. These are the articles, pictures, and other contributions that showcase the polished result of the collaborative efforts that drive *Wikipedia*. All featured content undergoes a thorough review process to ensure that it meets the highest standards and can serve as the best example of our end goals. A small bronze star in the top right corner of a page indicates that the content is featured.

Jones argues that successful "Featured Article" candidates benefit from more edits concerning stylistic aspects of their writing. "The effects of *Wikipedia*'s growth, evidenced by additions to articles and encouraged by the consensus-making features of the site, provide an abundance of 'macrostructure' material; however, for articles that are perceived to be of lesser quality, this abundance is not coupled with a similar wealth of stylistic editing" (Jones, 283). The findings of the study can, again, be interpreted as a validation of the goals and ideals of *Wikipedia*, as higher numbers of contributions, and more diverse contributions, are essential to achieving articles that exhibit greatest overall quality.

The studies discussed above contribute to establishing a more nuanced understanding of the author function as it emerged and evolved within the *Wikipedia* community. By adopting the collaborative work practices first established by open source software communities and by laying out comprehensive and detailed policies and guidelines, *Wikipedia* appears to have successfully transformed the process of writing encyclopedic articles. While questions regarding the sustainability of the project's future will always be

relevant, as a model, *Wikipedia* challenges the institutional authority inherent in expert written encyclopedias of the past centuries and replaces it with validated sources and a novel form of peer-review.

I have presented the evolution of the author function in encyclopedias over centuries and in accordance with the analyses of leading historians in the field. While the author figure emerged as the source and guarantor of its own authority, changing social and intellectual trends led to the development of institutions specialized in recognizing and arbitrating authority. *Wikipedia* represents a model whereby each text is validated through another and the authority of encyclopedic knowledge is justified through the richness of the network of validations it can call upon. In this new discursive network, to use Foucault's terminology, the author figure is only one of the differentiators of a single edit. As mentioned before, each edit is recorded individually, no matter how seemingly insignificant, and they are delineated by the date and time of when the edit was saved along with the username (I.P. address in the case of anonymous edits) of the editor who made it. The result is an encyclopedia written by no one in particular and which disseminates its contents through the World Wide Web.

In the next section, I will discuss the organizational principles along which *Wikipedia* is produced and accessed, and contrast these practices with previous encyclopedias and some of the ideas I have discussed in the second chapter concerning imagined ways to advance encyclopedias through 20th century.

4.4 Organizing Principles

4.4.1 Medium and the Message

Building on constantly evolving principles concerning knowledge and authority, encyclopedias were equally shaped by their approach to organizing content. While they were initially an integral part of questions regarding the nature of knowledge, very early on in the development of encyclopedias organizational principles became an independent area of development and experimentation. As Clark notes:

> The ordering of knowledge is as much at the center of the encyclopedic enterprise as is the discovery or retrieval of knowledge. If knowledge is merely heaped up, it cannot be communicated, cannot be used. This mass of data, then, like noise in information theory, is the ground against which complex orders and information become perceptible. (99)

Moreover, the influence of the changing media landscape over encyclopedias can be observed most clearly through their organizing schemes. To illustrate, in the following sections I will go through my earlier findings regarding organizing principles and analyze them through the co-evolution of communication media.

The impact of the particular media of communication on the organizing principles of any given encyclopedic project proves to be of comparable importance to the understanding of knowledge and authorship. The shift from orality to literacy, considered to be one of the most important moments of transition in history by many scholars such as Ong, Bolter, Innis and McLuhan, among others, also enabled the recording of encyclopedic works. It would be inconceivable to imagine that pre-literate cultures did not aspire to collect knowledge and pass it on from generation to generation. The deep and rich storytelling heritage found in many oral cultures of the past and present indicate they achieve this through specialized uses of language and various mnemonic devices. However, for the encyclopedic urge to exist in any recognizable shape, the invention of writing, specifically of the phonetic alphabet, was crucial. As Walter Ong argued, the externalization of language enabled participants of any given culture to identify knowledge separately from the knower, and to scrutinize it independently. Ong credits the birth of philosophy, history, science and all critical, rational thought to this separation. James Gleick, in his volume

chronicling the evolution of information storage and processing, also notes that this separation "arises at the very dawn of history, as it must, because the history begins with the writing. The pastness of the past depends on it" (2011, 28).

Following the work of Havelock, Gleick goes on to further discuss the effects of writing on the emergence of categorization systems. As Havelock observed, Plato was among the first to discuss the effects of writing on the human mind, and he was wary of its consequences because he realized the externalization of knowledge would be the result of this technology. As Havelock argues (Havelock qtd. in Gleick, 37):

> [Plato] is trying for the first time in history to identify this group of general mental qualities, and seeking for a term which will label them satisfactorily under a single type ... He it was [...] who hailed the portent and correctly identified it. In so doing, he so to speak confirmed and clinched the guesses of a previous generation which had been feeling its way towards the *idea* that you could "think," and that thinking was a very special kind of psychic activity, very uncomfortable, but also very exciting, and one which required a very novel use of Greek.

Aristotle built on this foundation by expanding on the act of thinking, through his categories, which, according to Gleick and Ong, allowed him to formulate abstract logic. Gleick states that, "logic descended from the written word, in Greece as well as India and China, where it developed independently" (37). In short, the introduction of literacy enabled "a twisting journey from things to words, from words to categories, from categories to metaphor and logic" (Gleick, 39).

The evolution of these metaphors throughout ages came to define the organizational schemes of encyclopedias for the rest of their history. After the adoption of paper and book format in the late Roman era, the encyclopedic form was only challenged with the introduction of print several centuries later. Earlier in this study, I have covered extensively the study of the effects of the printing press on social change. Whether one would agree with scholars such as Eisenstein on the degree of impact of these changes, or her observations regarding the effects created by the proliferation of print is not at issue. Among the six major effects of the proliferation of the printing press Eisenstein identified, which I discussed in detail in chapter one, "Standardization, Reorganization and Preservation", had a direct influence on the organizational structures employed by encyclopedia compilers.

Standardization among different copies of the same work allowed compilers greater control over their output while offering them the space to include more detailed maps, charts and other visual materials. In addition to increased standardization, Eisenstein argues that the most important change occurred in the mode of preservation. While books used to be made out of the most durable materials available and were treated as valuable artifacts, the abundance of print redefined the preservation of books through an abundance of copies. Both standardization of content and the new approach towards preservation was instrumental in motivating compilers to agree upon and share organizational paradigms, or what Eisenstein called reorganization. For the first time in history, printing made it possible to reference the contents of a book by page number across all copies. This greatly facilitated the preparation of common bibliographical indexes and library catalogues, while such works existed before, their utility was extremely limited as catalogues and bibliographies could only refer to individual copies of books or contents of a specific library. Arguably, the greater need for standardization among different works diminished the appeal for individual editors to leave their mark in the shape of unique categorization systems, and in turn proved a motivation for slowly embracing alphabetical sorting.

While the proliferation of print has brought the encyclopedia into modern era, my previous analysis of 20th-century thinkers on the subject illustrated that the limitation of print was becoming apparent, and that the next step in the evolution of the organization of encyclopedic knowledge was apparent to even some of the earliest pioneers of the period. In this section I aimed at establishing the evolution of patterns in the organizational schemes of encyclopedic thought, and the ways in which they interact with particular media ecologies, I will now highlight some of the particular choices made by compilers throughout centuries to illustrate how these overall patterns are manifested in notable works.

4.4.2 Scrolls, Codices and Sets

The imposed compromise arising from the struggle between the limitations of what is physically possible with any given medium and the urge to contain all that can be known defines the history of encyclopedias. The history I have outlined in the earlier sections of this study illustrated that, while the evolving media landscapes have a profound influence on the organizational paradigms of encyclopedias, within each era, the organizational scheme also proves to be one of the most prominent areas where individual compilers can differentiate their efforts from their predecessors and contemporaries. While this was especially the case during the medieval period, when in 1974 philosopher Mortimer Adler became the chairman of the board of editors of the *Encyclopedia Britannica* with the intent of revitalizing the enterprise, his most notable effort was a restructuring of the articles contained in the encyclopedia into distinct sets, namely *Micropaedia*, *Macropaedia* and *Propaedia*, thereby attesting to the enduring importance of organizational principles.

The metaphorical shape of a container in which one could combine all human knowledge would undoubtedly be defined by the assumptions of the compiler regarding the nature of that knowledge and the authorial role he or she envision for the editor, as well as those concerning the physical limitations of the medium in use. In terms of physical form, while the dialogues of Plato and the treatises of Aristotle were originally recorded on papyrus scrolls, the availability of paper ensured that the codex quickly became the norm for compilers, given the apparent increase in capacity, durability and other practical implications. While the physical shape of a book, whether hand-written or printed with movable type did not change for nearly two millennia, the organization of the knowledge within the covers of books offers unique insights into the priorities and perspectives of compilers.

While initially based on Aristotle's *Categories*, the complexity involved in the organizational schemes developed by compilers grew as their sources increased in number and diversity, however slowly. Moreover, the impulse to present a visual representation of the imagined organization of knowledge can also be dated to antiquity, emphasizing the intention to present an all-encompassing view of the knowledge landscape. As previously

noted, Porphyry of Tyre, who inspired the later Roman compilers with his illustration of Aristotle's *Categories* into a tree of knowledge, visualized the conceptions of knowledge inherent in all the encyclopedic works up to that point. However, among the first changes made to the foundations laid by Aristotle were various expansions, also made by Roman compilers that aimed at being more practical for their contemporary readers. Subsequently, the ever-widening scope of encyclopedic works provided the template for the great Medieval encyclopedias, whose compilers defined the form and content of encyclopedic knowledge for the following six centuries.

Among the most important organizing principles of the Medieval encyclopedia is the emphasis on completeness and comprehensiveness. Hugh of St. Victor's *Didascalion* represents the expansion of the fields of knowledge in the passing millennium from the time of Porphyry. Vincent de Beauvais's 13th-century work, *Speculum Mauis*, is considered to be one of the greatest achievements of this era and its name, meaning the great mirror, exemplifies the intent of the medieval encyclopedist. I have previously illustrated that the medieval encyclopedia was designed with the intention of becoming a companion work to the Book of God. Concerning this arrangement, Clark argues that "figuring the encyclopedia as mirror image implies that there is already an order or system to be discovered in human affairs and nature, and that the book can reflect this order that is unchanging and originates from God" (99).

The transformation that occurred due to the proliferation of the printing press that preceded the Reformation and Renaissance in Europe has been extensively covered throughout this study. However, it is pertinent to highlight that the organizing principles of encyclopedias were influenced by the proliferation of the printing press through the ideals of the Renaissance and the Enlightenment, which it partly enabled, as argued by Eisenstein, and not through any immediate effects on the craft of the compiler.

Following the revolutionary ideals of Francis Bacon and his call to collect and compile new knowledge at the end of the 16th century, first steps were taken that would lead to the emergence of the modern encyclopedia. Clark goes on to illustrate the change that occured during this critical period:

There is still a divine order in nature, but it is no longer simply given, easily reflected. Rather, nature needs interpreting. In the interests of objectivity, the encyclopedist, like the scientist, must now be respectful of nature's differences and attentive to his own biases. At this point, the encyclopedic project becomes self-conscious and self-figuring; encyclopedists describe their methods and assumptions in prefaces, discourses and articles on the encyclopedia. (100)

The shift to alphabetical organization from thematic classification is one of the defining features of the modern encyclopedia. It signifies, by treating all the subject matter equally, an objective viewpoint on the part of the compiler while it also points to an infinite number of possible connections among articles via cross-references. This fundamental shift in organizational principles is inseparable from the transformation in the understanding of knowledge that also occurred during this period. With the foundation of modern scientific disciplines, treatment of all subject matter from an equal critical distance became a much more suitable option, as opposed to the thematic classification of the Medieval encyclopedias whose ordering system was attributed to theology or to philosophical stances that were considered true and beyond questioning.

While alphabetization standardized organizing principles among different encyclopedias, editors' desire to make their mark on the overall scheme they envisioned for their works persisted, mostly in the prefaces or other preliminary material and, perhaps most notably, in the "trees of knowledge" and other visualizations. While a continuation of a practice that dates back to antiquity, the tree of knowledge featured or was alluded to in most of the works of the early Enlightenment philosophers, including Bacon. When Diderot and d'Alembet presented their version of Bacon's classification of knowledge, first in the *Preliminary Discourse*, and then later in the *Encyclopédie*, it was one more way for them to express their progressive views to their readers. However, as I have previously argued, the inclusion of such visualizations was more as demonstrations of the landscape of knowledge as understood by the compiler and not as navigational aids or roadmaps. Perhaps more noteworthy might be Diderot's adaptation of a seemingly neutral stance, which might be considered subversive in and of itself, in the form of the alphabetical classification to his ideological and political preferences. His seemingly benign cross-references would refer to contradicting articles or hints as to the opinions of the editors (Yeo, 2001, 45).

While most of the pioneering works of the Enlightenment attempted to chart relationships between the newly established sciences, one notable exception was the first edition of the *Encyclopaedia Britannica*. While its editor admittedly rushed the first edition, later and much improved incarnations of the famous encyclopedia never resorted to providing a diagram to present the overarching scheme behind its alphabetically organized articles. However, the overall organization of the body of knowledge has certainly continued to hold importance in the mind of the editor-in-chief. Mortimer Adler, the editor of the fifteenth edition of the *Britannica* who stated that "an encyclopaedia should not merely be a 'storehouse of facts,' but should also be a 'systematic survey of all departments of knowledge'" (Adler, qtd. in Clark, 101). Clark also notes that Adler returned to the circular nature of knowledge implied in the word "encyclopedia", and highlights the equality of all points around the circumference of a circle as a representation of the equality of all branches of knowledge, a gesture that arguably found its greatest incarnation in print with alphabetical ordering of articles.

The remarks of Adler, highlighting the suitability of alphabetical organization to Plato's original vision, arguably provides one of the strongest cases that the modern encyclopedia reached a peak in its development during the early 20th century. Building on several centuries of refinement, the modern encyclopedia appeared to have reached the limits of what is possible with available means of media technology. However, the ever-accelerating accumulation of knowledge never ceased to render previous efforts inadequate, and indeed this challenge is a defining feature of the contemporary encyclopedic endeavor, and the continuing pattern for oncoming decades.

The attempts to transcend the limits of printed volumes in order to create a more complete and easily navigable encyclopedia were covered extensively in chapter two. As my overview of the works of Otlet and Wells in that chapter have illustrated, improving the efforts of these visionaries were not primarily focused on challenging the understanding of knowledge implied in an encyclopedic work, or imagining new forms of authorship. Instead, Otlet and Wells were concerned with improving the coverage of the encyclopedia and rendering its contents more accessible and pervasive. Even when their speculations and musings passed into the domain of pure science fiction, prominent authors of 20th century,

arguably with the exception of Douglas Adams, imagined encyclopedias that are less bound by the limitations of printed books and as more accessible repositories of interconnected knowledge.

The imagined leap forward materialized in the form of computer-based communications and hypertext it enabled. The computerization of text entry and organization redefined what is possible for compilations of knowledge. However, the introduction of hypertext was followed closely by the World Wide Web, where links not only connect parts of a single work but potentially connect every piece of information on the entire network. While at first glance these developments resemble precisely what futurists like Otlet and Wells dreamt of at the beginning of the century, an interconnected network of knowledge that allows organic growth, the combined effect of the global Internet also fostered an entirely new type of encyclopedia that was capable of growing in coverage and reaching previously unimaginable levels of dissemination.

As the struggle to transcend the limitations of print only serves to illustrate, the form and organizational principles of encyclopedias were fundamentally shaped by the nature of the book prevalent at the time of the compiler. As Cormack and Mazzio state in *Book Use, Book Theory: 1500-1700*, "to use a book is to experience it in time" (3). In this section, I have illustrated the constant struggle of compilers to advance their works through better organizational principles, through which they both aspired to improve navigation for their readers while materializing their philosophical stances regarding the categorization of knowledge. As the authors of *Book Use, Book Theory* argue:

> To use a book is to engage with it as a set of forms and as a condition of thought; in this sense, the history of the book use and the history of theoretical speculation are entwined. Indeed, when authors or printers deployed textual forms to make books more navigable or useful, they often reflected upon those technologies to emphasize the book's relation to specific fields of knowledge and specific forms of thinking. (5)

Having now established the close relationship between the organizational principles of encyclopedias and the dominant method of their production, in the following section of this study, I will analyze the next phase of their interconnected evolution.

4.4.3 Interconnectedness of all Things

In previous chapters I covered the technical and conceptual history of the evolution of hypertext and the Internet. As I have argued, the origins and evolution of these tools gave *Wikipedia* some of its founding principles and continue to guide the project today. However, when analyzing the organizational principles of *Wikipedia*, the impact of networked ubiquitous computing and hypertext becomes significantly more concrete. As I will demonstrate in this section, when compared to other initiatives from established encyclopedia makers to put their compilations online, *Wikipedia* presents itself as a native of its medium. This, indeed, is an encyclopedia only made possible through the sufficient maturity of its chosen method of production. While *Wikipedia* does not represent the pinnacle of the Web's evolution, for the Web is still considered "new media", it is undeniably the shape of things to come, particularly where organizational principles are concerned. In this section, I will explore the ways in which *Wikipedia* is shaped, and defined, by its nature as an online, hyperlink-based encyclopedia and analyze how these characteristics contribute to setting it apart from previous encyclopedic works.

The unique nature of hypertext has been under study throughout twentieth century. As mentioned earlier, the fictional works of Borges that questioned the nature of narrative flow and cause-and-effect may be considered early inquiries into the logic of hypertext. Following the actual realization of the technology, more analytical and comprehensive works followed. For example, in *Writing Space*, Bolter argued that with the proliferation of hypertext and computer-based communication, "we may come to associate with text the qualities of the computer (flexibility, interactivity, speed of distribution) rather than those of print (stability and authority)" (2001). I have discussed extensively the processes through which these associations with different media technologies are formed. In the case of hypertext, the ease of connection it allows between two arbitrary points and the actual ease of navigating through these links--one click from the user of a computer vs. potentially having to physically locate another volume of an encyclopedia and manually opening the referenced article--transform the experience of navigating the repository offered by the encyclopedia. While the increase in usability is so evident that it might be possible to argue

that every compiler who ever used cross-references in his/her encyclopedia aspired to something like the hyperlink, the effects of computer-based writing go further than an improvement in navigation.

In his study on the nature and effects of hypertext, Christian Vandendorpe echoes some of Bolter's arguments (2009, 2):

> Whereas a book intrinsically has a totalizing function and aims to cover a whole area of knowledge, hypertext encourages the use of a large number of links in order to explore associations between ideas, to "spread out" rather than to "dig," in the hope of engaging readers whose interests are constantly changing, moving from association to association. Every concept referred to in a hypertext is thus potentially a distinct entry that can in turn generate new branchings [sic], or more precisely, new rhizomes. It should be added that hypertext is by nature opaque, unlike a book, which has multiple, constantly accessible reference points. While reading a book is marked by duration and a certain continuity, reading hypertext is marked by a sense of urgency, discontinuity, and constant choices.

Vandendorpe goes on to argue that the effects of the medium can be felt beyond the ergonomics of the works prepared and which function within the actual composition of the text itself (35). This argument is in line with most of the other authors quoted earlier in this study regarding the increased critical distance between the reader and the text introduced first by print, and now by hypertext. Both transformations, of course, stem from the initial separation of the word from its utterer through the technology of writing and the phonetic alphabet.

In the case of *Wikipedia*, the nature of hypertext defines the experiences of both access to and creation of its content. The "Contents" link on the "Main Page" of the English *Wikipedia* leads the user to a portal featuring different sorting methods that can be used to explore the contents of the encyclopedia ("Main Page", "Portal: Contents"). The portal offers a sample from thousands of different lists, among them many lists of lists, in addition to different timeline views. *Wikipedia* also offers various category views, and broader "Portals" that aim to cover broader sets of articles, all identified and organized by editors in accordance with the guidelines identified in the "*Wikipedia*:Categorization" article.
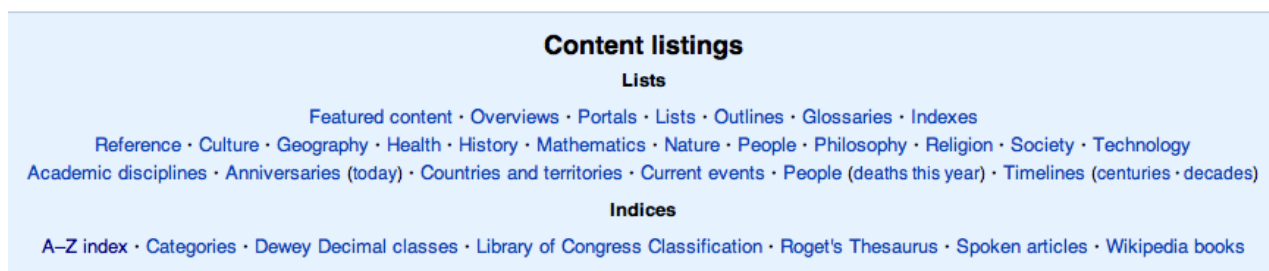
Figure 8 Content Listings of *Wikipedia*

This portal is an illustration of what David Weinberger calls a "third order of order" where both the information itself and the system of classification are digitized and therefore subject to further manipulation (2007, 19). Classifying physical objects themselves as the first order of order, Weinberger identifies traditional indices and catalogs as second order of order where the subjects of the order are still manifest in the physical world, like volumes of an encyclopedia or the contents of a library (ibid). As the above illustrated portal illustrates, storing both the contents and the system of categorization on a digital platform transforms the means to access the contents of any catalog. While this flexibility to adapt any categorization scheme simultaneously is a remarkable achievement in itself, even more remarkable is the fact that the overwhelming majority of users never require any formal categorization scheme at all to navigate the largest encyclopedia ever compiled. The typical consultation with *Wikipedia* is usually initiated by a search, through a general purpose internet search engine like Google, or through *Wikipedia*'s omnipresent search function on any of its pages. Following this initial entry point, the user can follow other links within the article following his or her own path, just as Otlet imagined a century ago, and all hypertext scholars and technologists have described over the past decades.

Alphabetical ordering of articles was heralded during the Enlightenment as it gave the opportunity for compilers to approach each subject from an equal distance. However, the overall organization of knowledge was still subject to the preferences of the compiler and was either implied through cross-references, or explicitly stated in the diagrams or treatises prefacing the encyclopedia content. *Wikipedia*'s interlinked articles recast the entire implied system of knowledge as a "miscellaneous" category, as coined by David Weinberger, and leave the shape of the connections to be formed up to each reader through each session. For

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the common reader, *Wikipedia* contains a system of knowledge whose complexity and interconnectedness is implied and built step by step over iterations rather than through an all-encompassing system imposed from the beginning by the editor-in-chief.

Beyond this transformation in ease of use and accessibility, the particular characteristics of Wiki software, built on top of the basic architecture of hyperlinks, allows *Wikipedia* to expand not only the reach of its coverage as I have so far illustrated, but the depth of this coverage as well. The fact that *Wikipedia* stores, and makes available, its entire history in all of its iterative steps, as well as the discussion that was involved in making these changes, is arguably a greater transformation over the previous encyclopedic efforts than the increase in navigability and organizational agility. In addition to rendering the process of article creation entirely transparent to its readers, prospective and experienced editors are able to observe and identify where their efforts might be most useful. However, the effects of ubiquitous capture of all activity that goes on in *Wikipedia* are more fundamental and far reaching. In a column written for the tenth anniversary of *Wikipedia* James Bridle speculated on these consequences (Bridle, 2011):

> This is historiography. This is what culture actually looks like, a process of argument, of dissenting and accreting opinion, of gradual and not always correct codification. And for the first time in history, we're building a system that, perhaps only for a brief time but certainly for the moment, is capable of recording and making use of every single one of those infinitely valuable pieces of information, a new project for every generation.

While not always appreciated by the average user or critic, the omnipresent historical record that *Wikipedia* brings to the encyclopedic endeavor is an inseparable component of the novelty it represents in the fields of knowledge creation and authorship practices. This is why any initiative that aims to increase awareness towards this new literacy to harness all that *Wikipedia* offers has to devote significant attention to understanding the historical advances that *Wikipedia* represents.

In my analysis of the organizational principles of *Wikipedia*, I have revisited the importance of hypertext and discussed the novel ways in which *Wikipedia* treats its own history and what this new attitude might signify. While many detractors over the past decade of *Wikipedia*'s existence have directed their criticism towards its issues of knowledge

and its specific version of authorship, the advances resulting from hypertext and the Wiki software that builds on top of *Wikipedia* are so clearly a net positive for the goals of the encyclopedic ideal that they have rarely been questioned. However, the organizational principles that constitute a significant part of *Wikipedia* emerge as an integral part of its attitude towards knowledge and authorship practices. While the accessibility and transparency enabled by the technical implementation of hypertext and Wiki software emerges as the most celebrated features of *Wikipedia*, the perceived advances they represent enable, and are enabled by, the wider framework of understanding knowledge and authorship practices, representing a novel approach to encyclopedia making as a whole.