Birds of a Feather: Some Fundamentals on the Archives–Ecology Paradigm*

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RÉSUMÉ Cet article passe en revue les concepts de préservation, de conservation et d'écologie, en vue d'établir le lien entre la théorie et la pratique archivistiques, ainsi que la philosophie et la protection environnementales, comme des domaines qui sont intellectuellement liés et non seulement analogues. En dépassant la métaphore de l'organique qui est omniprésente dans la littérature professionnelle, l'auteur invite les archivistes à examiner les idées et les applications parallèles tant au niveau des archives que de l'écologie qui peuvent agir sur le processus de prise de décision. Il encourage de plus les archivistes à s'éloigner du positivisme qui a souvent guidé leurs activités, pour se diriger plutôt vers un paradigme plus pluraliste tel qu'il se présente dans les sciences biologiques et physiques. Le résultat est une connaissance fondamentale de l'intersection théorique entre archives et écologie, en lien avec des modèles qui peuvent mener vers des applications pratiques dans l'évaluation et l'accès des archives.

ABSTRACT This article reviews the concepts of preservation, conservation, and ecology in order to establish archival theory and practice, and environmental philosophy and protection as intellectually related domains, not merely analogous subjects. Moving beyond the organic metaphor peppered throughout the professional literature, it challenges archivists to look more widely at the parallel ideas and applications in archives and ecology that can influence and inform their decision-making process, and encourages archivists to move further away from the positivism that has directed much of their activities toward a more pluralistic paradigm evident in the biological and physical sciences. The outcome is a fundamental understanding of the theoretical intersection of archives and ecology coupled with models that can guide practical applications in appraisal and access for archives.

* An earlier version of this paper was presented at the Society of American Archivists 69th Annual Meeting, New Orleans, LA, 18 August 2005. Special thanks to Leslie Czechowski, John Fleckner, Tim Johnson, Elisabeth Kaplan, William Maher, Daniel Necas, and Joel Wurl for their thoughtful insights and suggestions on previous drafts. I would also like to thank Robert McIntosh, Catherine Bailey, and the two anonymous readers who provided detailed commentary and means for improvement as well as enthusiasm for the ideas presented.

The privilege of possessing the earth entails the responsibility of passing it on, the better for our use, not only to immediate posterity, but to the unknown future.

Aldo Leopold[1]

The value of archives is often metaphorically expressed as being organic in nature and thus, having a degree of life, worthy of preserving. As archivists, we can read the analogous sentiment into our own work in the above quote from Aldo Leopold, a conservationist and early proponent of environmental ethics, as he articulated his early thoughts on communicating conservation theory, not only as an economic value, but also as a moral issue. But is it more than just a metaphor? Is there a relationship beyond the analogy? Archival thinking is prone to use the organic metaphor, yet its use is relatively unexamined. This article assesses the development of archival thinking and environmental thought as a means to draw out the significant parallels between the two and to establish the validity of using environmental philosophies as a model to evaluate archival activities.

In her work, Elisabeth Kaplan suggests archivists use cross-disciplinary comparisons to help us view our own field in a larger context by shedding new light on familiar thought and practice, reorienting us toward the broader intellectual climate in which we work, and ultimately helping us improve our practice through a conscious understanding of what we do.[2] The argument is not whether environmental philosophies are analogous to archival theory and practice, but whether archivists can add to the context of their work, as Kaplan suggests, by evaluating the shared space of the two disciplines.[3] This article does so by comparing the changing positions over time in environmental philosophy and archival theory, separate fields with arguably similar goals of preservation and thoughtful use. The results show that the larger considerations of preservation, conservation, and ecology extend beyond any single field, be it archives or environmental protection, and in turn, serve as a model

1 Aldo Leopold, "Some Fundamentals of Conservation in the Southwest [1923]," in *The River of the Mother of God and Other Essays by Aldo Leopold*, ed. Susan L. Flader and J. Baird Callicott (Madison, WI, 1991), p. 94. This essay, published posthumously, marked Leopold's first major attempt to introduce moral responsibility to the conservation of resources as an end in itself, beyond economic and utilitarian concerns that would later be the hallmark of his land ethic.

2 Elisabeth Kaplan, "'Many Paths to Partial Truths': Archives, Anthropology, and the Power of Representation," *Archival Science* 2 (2002), p. 211.

3 In the 1980s, environmental philosophy became a point of discussion in the archaeological and museum professions as a basis for establishing the ethical responsibilities of collecting and managing cultural heritage collections. Karen Warren called this insertion of environmental ethics into archaeology the "Non-Renewable Resource" argument, viewing cultural materials a non-renewable resource or endangered species that, once exhausted or destroyed, cannot be replaced. See Karen J. Warren, "A Philosophical Perspective on Ethics and Resolution of Cultural Properties Issues," in *The Ethics of Collecting Cultural Property: Whose Property, Whose Culture?*" ed. Phyllis Mauch Messenger (Albuquerque, 1999), p. 19.

for the activities of the archivist toward archival materials, users, and, in Leopold's terms, the unknown future.

Dilemmas of Preservation and Conservation

Archivists and environmentalists share the similar terminology of preservation and conservation; however, in their applied practices, their definitions are dissimilar.[4] Yet both fields have comparable concepts of preservation and conservation and models of theory associated with them. Within each field there are distinct characteristics separating the two concepts.

Environmental Concepts

In his work *Wilderness and the American Mind*, Roderick Nash writes about the initial schism between preservationists and conservationists, or between "those who defined conservation as the wise use or planned development of resources and those who have been termed preservationists, with their rejection of utilitarianism and advocacy of nature unaltered by man."[5] For nature preservationists, the setting aside of original, pristine areas of wilderness ensured the survival of natural spaces untouched by human intervention. Conservationists saw the need for protection in less romantic terms and instead geared their argument toward applied science and economic value. This schism is still prevalent today.

In North America, the romantic aesthetic preservation ethic is historically embodied in the writings and activism of John Muir. A follower of Transcendentalism, Muir believed wild nature had a liberating influence conducive to human happiness.[6] He actively sought to convert others to his point of view, writing, "I care to live only to entice people to look at Nature's loveliness."[7] Muir's philosophies migrated north to Canada and became engrained in the work of James Harkin, Commissioner of Dominion Parks, who "lost few occasions to quote the American [Muir] at length in his departmental reports to the Minister of the Interior."[8] Arguably, Muir's most notable preservation battle was the protection of the Hetch Hetchy Valley from

4 Preservation and conservation have very distinct connotations in archival practice. Preservation is one of the three primary tasks of the archivist, along with acquisition and access. Preservation serves to ensure long-term protection of the physical material from damage, deterioration, theft, and improper use. Conservation in archival practice refers to the care and restoration of materials that are not in a stable condition and need professional treatment prior to being accessed by a patron.

5 Roderick Nash, *Wilderness and the American Mind* (1967; repr., New Haven, 1982), p. 129.

6 Ibid., p. 123.

7 Muir quoted in Nash, p. 129.

8 Janet Foster, *Working for Wildlife: The Beginning of Preservation in Canada* (Toronto, 1998), p. 14.

becoming a reservoir for the city of San Francisco. Although preservationists lost the battle for Hetch Hetchy in 1913, it created a national awareness of the loss of natural spaces and cast preservation concerns as a political issue. This politicization of nature preservation is still active in the work of advocacy organizations such as the Sierra Club and Defenders of Wildlife.

Popular enthusiasm for the utilitarian conservation ethic grew in North America as both the United States and Canada implemented its applications as a political tool for nation building at the turn of the twentieth century. A primary figure in the early beginnings of the conservation movement in the United States was Gifford Pinchot, who also had a decidedly influential role on Canadian conservation practices.[9] Pinchot, a Yale graduate and trained in Germany in scientific forestry, became head of the Bureau of Forestry in 1908. An advocate for wise use, scientific management, he soon convinced the federal government, timber companies, and lumbermen that selective logging, brush burning, and fire control had a practical and economically beneficial outcome for the industry and created a sustainable yield.[10] In a 1906 address to the Canadian Forestry Association, Pinchot declared, "I have no interest in a forest that is not of use ... if all we get out of them is the knowledge that we have them, then, so far as I am concerned, they disappear from my field of interest. But use is the end of forest preservation, and the highest use."[11] His implementation of conservation practices modernized federal land–management programs by reflecting the tenets of progressivism in North America in general and institutionalizing the secular ethic of utilitarianism in the newly-created governmental conservation agencies.[12] Samuel Hays refers to Pinchot's progressive conservation as the "gospel of efficiency," where conservation serves as an antidote to unchecked waste and loss of natural resources on a national scale.[13] The federal policies of the United States and Canada have not steered far from this concept since they were developed.

Preservation, underscored by late nineteenth-century positivism, emphasizes the natural order of the environment and abhors the disturbance an industrializing society presents. Conservation, relying on progressive and scientific ideals, perceives nature to be a collection of bits of matter that can be hierarchically arranged and manipulated by analytic and reductive meth-

9 See Foster, pp. 32–38. See also John Sandlos, "From the Outside Looking In: Aesthetics, Politics, and Wildlife Conservation in the Canadian North," *Environmental History* 6 (January 2001), pp. 6–31.

10 Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (Pittsburgh, 1959), pp. 28–29.

11 Pinchot as quoted in Foster, p. 35.

12 J. Baird Callicott, *Beyond the Land Ethic: More Essays in Environmental Philosophy* (Albany, 1999), pp. 322–23.

13 See Hays for a detailed analysis of Pinchot and the conservation movement.

ods.[14] The preservation and conservation dilemma asks how much to save and for what purposes and how best to use that which is saved. The answer depends on the ethical imperative chosen: to preserve or to advance wise use.

Archival Concepts

Similar to the schism in North American environmental thought at the turn of the twentieth century, the concepts of preservation and conservation in archival theory represent a theoretical clash between holistic preservation and utilitarianism. The evaluation of these two viewpoints situates archives in a larger sphere concerning the ethical imperatives found in fields focused on providing protection and use. Preservation ensures the unaltered condition of a documentary set of records, emphasizing the moral duty to preserve intact records. Conservation applies utilitarian techniques, emphasizing limited selection in an environment of ever-increasing amounts of documentation in order to make the materials available. The approach reflects the ethical imperative chosen by the archivist, either to document the whole record at the expense of access, or to select materials based on quantitative and pragmatic judgments in order to support access and maintenance: to preserve or to advance wise use. For archivists, the dilemma of preservation versus conservation links closely to ongoing debates on appraisal.

The idea of the natural processes by which archival materials accumulate follows the notion set forth in Muller, Feith, and Fruin's end of the nineteenth century description of an archival collection as "an organic whole, a living organism, which grows, takes shape, and undergoes changes in accordance with fixed rules."[15] More recently, Luciana Duranti expressed the opinion that since archival documents "accumulate naturally, progressively, and continuously, like the sediments of geological stratification," they provide "an element of spontaneous yet structured cohesiveness."[16] From this perspective, archival records, created during administrative or transaction processes, have an intrinsic value through their interrelationships, relationships born at their creation and necessary for them to act as pieces of evidence.[17] Having such a value, the archivist's duty is to the integrity of the whole record, not to single out records for individual preservation. As an early proponent of the preserva-

14 Callicott, p. 323.

15 S. Muller, J.A. Feith, and R. Fruin, *Manual for the Arrangement and Description of Archives*, trans. Arthur H. Leavitt (New York, 1940), pp. 19–20.

16 Luciana Duranti, "The Concept of Appraisal and Archival Theory," *American Archivist* 57 (Spring 1994), p. 335. Duranti is paraphrasing from Robert-Henri Baultier's "Les Archives," in *L'historie et ses méthodes* (Paris, 1961), p. 1120.

17 Ibid., p. 335. The concept of interrelationship is the fourth characteristic Duranti uses to attribute value to archival documents, the others being impartiality, authenticity, and naturalness.

tion of evidence, Sir Hilary Jenkinson believed it to be the moral duty of the archivist to create archives *ex hypothesi*, allowing the materials to represent their creator without interpretation "*provided that it has come to us in exactly the state in which its original creators left it*."[18] Jenkinson charges the archivist to

> hand on the documents as nearly as possible in the state in which he received them, without adding or taking away, physically or morally, anything: to preserve unviolated, without the possibility of a suspicion of violation, every element in them, every quality they possessed when they came to him ...[19]

Here is the parallel between the *ex hypothesi* archives and the romantic preservation ethic: each focuses attention on the intrinsic value of the organic process regardless of the instrumental value it may serve. Duranti cautions that attributing an instrumental value to the evidence of archival documents would mean to renounce impartiality, endorse ideology, and consciously and arbitrarily alter the societal record.[20]

Nature conservationists recognize the organic structure preservationists seek to protect; yet for society to develop, natural resources must be used. Conservation theory offers the protection of as much of the organic structure as possible while providing for human development. Appraisal theory in archives, much like nature conservation, asks the archivist to apply utility theory to the organic archival process as a method of modern documentation. Whereas those advocating for the preservation of evidence in archives leave the role of appraisal to the creator, and thus part of the organic process, a utilitarian approach suggests the archivist take an active role in selecting, appraising, and organizing archival materials. This approach is especially evident in the management of voluminous amounts of modern records. As an advocate for appraisal, Theodore R. Schellenberg, born during the progressive movement and working for the federal agencies stemming from it, saw archival materials, like the utility of natural resources, as having varying degrees of usefulness to society. Schellenberg emphasized an appraisal theory that protects evidence without advocating that the archivist save all records. Archivists are encouraged to be analytical in their choices while maintaining a sense of "moderation and common sense."[21] Frank Boles and Julia Young sought to encapsulate the principles of moderation by developing a dynamic

18 Hilary Jenkinson, "Reflections of an Archivist," in *A Modern Archives Reader: Basic Readings on Archival Theory and Practice*, ed. Maygene F. Daniels and Timothy Walch (Washington, DC, 1984), pp. 19–20. Emphasis in original.

19 Ibid., p. 20.

20 Duranti, p. 344.

21 Theodore R. Schellenberg, "The Appraisal of Modern Public Records," in *A Modern Archives Reader* (see note 18), p. 68.

list of components and their elements to aid in the appraisal process by evaluating the value of information, the cost of retention, and the implications of accession.[22] Their appraisal model relied on the cumulative response to the three components and acknowledged that "the collective value of the records is greater than the sum of their parts."[23]

Archives are Ecosystems

In environmental protection, Callicott explains, "environmental concerns have little to do with the welfare of individual bugs, shrubs, and grubs, and a great deal to do with wholes (such as species and ecosystems) and with abiotic aspects of nature (such as the atmosphere and the ocean)."[24] This ecological value emphasizes the relationship between intrinsic value and instrumental value, which creates a systemic value. In systemic value, things do not have their separate natures merely in and for themselves, but face outward and co-fit into broader natures like cogs in a machine, or more organically, like beavers in a pond.[25] So too is the case with modern archives, if archives are considered more than just a sum of their parts. As in the concepts of preservation and conservation, intrinsic value tells us to look at the item (whether it is a document or collection) itself; a systemic or ecological value tells us to look further afield at the information relationships the material produces.[26]

Ecological Concepts

Ecology is the understanding of relationships between spatially close organisms and their surrounding biological and physical environment. The science of ecology emerged from late-nineteenth-and early-twentieth-century studies of biomes, which are areas of climatic, soil, and organic interaction.[27] The term ecosystem refers to the specific interactions between the organic and inorganic in biomes. In the late 1930s, Raymond Lindeman, a wetland biolo-

22 See Frank Boles and Julia Young, "Exploring the Black Box: The Appraisal of University Administrative Records," *American Archivist* 48 (Spring 1985), pp. 121–140.

23 Ibid., p. 137.

24 Callicott, pp. 258–59.

25 Holmes Rolston, III, *Conserving Natural Value* (New York, 1994), pp. 173–174. The North American beaver (*Castor Canadensis*) is often described as a keystone species, meaning a native species that offers a unique contribution to a biotic community through its activities that is directly related to the continued existence of its community. See R.T. Paine, "A Note on Trophic Complexity and Community Stability," *The American Naturalist* 103 (Jan.–Feb. 1969), pp. 91–93; and Mary Power et al., "Challenges in the Quest for Keystones," *BioScience* 46 (September 1996), pp. 609–620.

26 Rolston, p. 174.

27 For early studies on biomes see Stephen A. Forbes, "The Lake as a Microcosm," *Bulletin of the Scientific Association* (Peoria, 1887), pp. 77–87; and Fredric Clements, *Plant Succession: An Analysis of the Development of Vegetation* (Washington, DC, 1916).

gist studying plant/animal interactions in a lake bog, published an article documenting the transfer of energy vertically and horizontally through the bog's food chain.[28] This transfer of energy from one part of an ecosystem to another is what Lindeman referred to as the "trophic dynamic." He emphasized that "this constant organic-inorganic cycle of nutritive substance was so completely integrated that to consider even such a unit as a lake primarily as a biotic community appears to force a 'biological' emphasis upon a more basic functional organization."[29] As an obstacle to understanding the ecosystem concept, Lindeman faulted the discrimination between living organisms as parts of the "biotic community," and dead organisms and inorganic nutrients as parts of the "environment" as being arbitrary and unnatural.[30] His example of the difficulty in drawing clear-cut lines between the living *community* and the non-living *environment* consisted of trying to determine the status of a slowly dying pondweed covered with periphytes.[31]

By the end of the twentieth century, the study of ecology and ecosystems built upon Lindeman's work by incorporating the influences of natural and manufactured disturbances (also referred to as patch dynamics) on the natural succession of organic life and the inorganic environment. The complexities resulting from these newly understood relational dynamics of energy and instability put into question the practiced principles of environmental preservation and conservation. The potentially destructive features of previously believed stable, pristine environments alerted preservationists and conservationists that both theories of non-involvement and applied science were inadequate management systems if they excluded these systemic–ecological relationships. Ecologists realized that the "preservation of natural systems necessarily involves a paradox: we seek to preserve systems that change."[32]

28 Raymond L. Lindeman, "The Trophic-Dynamic Aspect of Ecology," *Ecology* 23 (October 1942), pp. 399–417. Robert P. McIntosh refers to Lineman's article as a "watershed in ecology" and emphasizes Lindeman's endorsement of the "relatively unknown term *ecosystem*." Robert P. McIntosh, *The Background of Ecology: Concept and Theory* (New York, 1985), p. 125.

29 Lindeman, p. 400.

30 Ibid., p. 399. Leopold came to a similar conclusion in 1923 writing, "There is not much discrepancy, except in language, between this conception of a living earth, and the conception of a dead earth, with enormously slow, intricate, and interrelated functions among its parts, as given us by physics, chemistry, and geology." See Leopold, p. 95.

31 Lindeman, p. 399.

32 S.T.A. Pickett and P.S. White, "The Ecology of Natural Disturbances and Patch Dynamics," in *Major Problems in American Environmental History*, ed. Carolyn Merchant (Lexington, MA, 1993), p. 460.

Archival Concepts

Archivists face a similar paradox when preserving information. Information has its own trophic dynamic. It is absorbed, reconstituted, rejected, and reused before being passed on to the next consumer who is dependent on the previous dynamic. The ecological approach to the information in archives, not just the documents, lessens the emphasis on the intrinsic value of the object found in preservation or the instrumental value in conservation. Intrinsic and instrumental values, as a means of justification, become problematic in a holistic web where everything is connected: the value of individual objects is no longer emphasized. Holmes Rolston explains: "Every intrinsic value has leading and trailing *ands* pointing to value from which it comes and toward which it moves ... Intrinsic value is part of a whole, not to be fragmented by valuing it in isolation."[33] In both environmental ethics and archival theory, systemic value stems from the context of the object, the information relationships, the "leading and trailing *ands*," outside of which it is meaningless.[34]

Yet it is impossible for the archivist to approach the full human record of information and its almost infinite relationships. Botanist Arthur Tansley was the first to point out this conundrum in the emerging field of ecology in the 1930s. His advice was to isolate ecosystems intellectually that could range from the universe as a whole down to the atom.[35] He then looked at the different "isolates" in question.

> The series of *isolates* we make become the actual objects of our study, whether the isolate be a solar system, a planet, a climatic region, a plant or animal community, an individual organism, an organic molecule, or an atom. Actually the systems we isolate mentally are not only included as parts of larger ones, but they also overlap, interlock and interact with one another. The isolation is partly artificial, but is the only possible way in which we can proceed.[36]

Ecosystems are in fact artificial designations. They are a construct of science, not the object of science itself.

Archivists are versed at isolating materials in a repository by collection or provenance; however, from an ecological point of view, archives themselves are a series of isolates. Archival programs are mental constructs that then determine the physical distribution of materials. The archives of a state university, for example, are an isolate of all university archives. Likewise, all

33 Rolston, p. 174. Emphasis in original.
34 Callicott, p. 261.
35 A.G. Tansley, "The Use and Abuse of Vegetational Concepts and Terms," *Ecology* 16 (July 1935), p. 299.
36 Ibid., p. 300.

university archival programs are an isolate of higher education within a particular region or country, and so on. Although Tansley is correct in noting that only through working with isolates are we able to develop practical applications, archivists rarely acknowledge the larger ecology of archives and the constructed isolation of archives and the materials they contain.

In order to gain a sense of the whole system and the trophic dynamic running through the archival ecosystem, archivists should refine archival theory by incorporating ecological models. Since the 1980s, a handful of archivists have done just that. Their work has been for the most part cumulative, but to date has not substantially moved archival theory and practice in North America beyond the focus of intrinsic and instrumental values to a more integrated systemic value.

Integrated Models

Hugh Taylor wrote that ecology "suggests a non aggressive stewardship, a sensitive interplay, and an ongoing enrichment of resources," commenting that "it lies behind much of our work today."[37] This statement and the article from which it stems have become a seminal work in the pairing of ecological with archival theory. Taylor explains the difficulty of drawing the distinction between active and historical records. This is a distinct departure from the traditional biological life–cycle metaphor for records and demonstrates the archival parallel with the transfer of energy between the organic and inorganic in Lindeman's ecosystem. Taylor explains that

> We must be prepared to abandon the concept of archives as bodies of "historical" records over against so-called active records which are put to sleep during their dormant years prior to salvation or extinction. Records are active in direct proportion to the relevant information that can be retrieved from them, and dormancy is closely related to the inability to retrieve information.[38]

In Lindeman's terms, records are part of the ecosystem when they provide nutrients, or in Taylor's words, when information can be retrieved; it does not matter whether they are part of the living community (active records) or the environment (historical records). The duality of active and inactive records becomes – as noted in ecosystems – increasingly arbitrary and unnatural.

Candace Loewen, in her article on the appraisal of environmental records, asserts that the "longstanding neglect of the whole has led to the present

37 See Hugh A. Taylor, "Information Ecology and the Archives of the 1980s" in *Imagining Archives: Essays and Reflections*, ed. Terry Cook and Gordon Dodds (Lanham, 2003), p. 90.
38 Ibid., p. 96.

deplorable state of the environment – and of archives."[39] Loewen points out the organic nature of archives and the archivist's ability to recognize patterns, connections, and linkages in records through their training and experience. She explains that this positions archivists to approach records appraisals holistically and to focus on the contextual framework in order to appraise soundly.[40] Loewen suggests: "We have been too 'human-centred' in documenting human activities and institutions ... We have neglected the earth, what Hugh Taylor calls 'planetary evidence', and by doing so we have done a disservice to humanity, to ourselves."[41] In order to have a more ecological model in archives, she wants archivists to be more sensitive to the "survival values" of records – the potential ability of records to protect lives and the environment – during the appraisal process. Appraisal must be environmental, meaning contextual. According to Loewen,

> To take a holistic, inclusive approach to records appraisal means to take an "integrated" look at the records in question. By taking an integrated approach, one may hope to reach some "integral" or "holistic" representation of a function, event, change in society or idea.[42]

Loewen builds on Taylor's concern over the duality of archives and questions the custodial activities and priorities of the archivist.

In the United States, the abandonment of the life-cycle model in favour of archivists being "present at the creation of documents" has taken less hold of archival theory than in other places.[43] Yet ecological thinking is present in much of the recent discourse. One notable example is William Maher's use of chaos theory as a means to explain various aspects of archival work.[44] In the sciences, chaos theory assists in determining patterns and their variables in large dynamic systems, such as the atmosphere, that appear to be random events. As an example of this application in archival work, Maher describes Schellenberg's *a posteriori* classification and emphasis on relationships rather than parts in archives as scientific in nature.[45] It focuses less on the randomness of individual objects and more on the discernable variables that influence decision making, such as the variable of volume and its affect on archival

39 Candace Loewen, "From Human Neglect to Planetary Survival: New Approaches to the Appraisal of Environmental Records," *Archivaria* 33 (Winter 1991–92), p. 87.
40 Ibid., p. 89.
41 Ibid., p. 91.
42 Ibid., pp. 99–100.
43 Taylor, p. 96.
44 William J. Maher, "Chaos and the Nature of Archival Systems" (paper presented at the Society of American Archivists 56th Annual Meeting, Montreal, Quebec, Canada, 15 September 1992), http://web.library.uiuc.edu/ahx/workpap/chaosshort.pdf (accessed on 23 February 2007).
45 Ibid.

appraisal.[46] Similarly, Maher looks at Boles and Young's work in quantifying appraisal. He points out in their own conclusion that "the complex nature of the relationships required a model that recognized how the decision process changed as each element in the relationship changed," emphasizing that the two authors are merely referencing the chaotic nature of archives.[47] Each decision, each relationship, is a variable with its own set of elements. Each can be traced back through an *a posteriori* lens reducing the role of apparent randomness.

Postcustodial Models

The traditional custodial role of humans in preservation and conservation requires a segregation of human interests from the ecosystem; yet modern ecology heightens the degree to which humans are viewed as non-privileged members of the ecosystem. To rectify this dualism, humans can no longer view themselves as caretakers separate from and unaffected by the environment.

A similar movement away from the custodial role is found in archival theory. Building upon the work of Ian Maclean and Hugh Taylor, Frank Upward's two articles on the records continuum specifically address the custodial tradition in archives.[48] In his discussion of virtual archives and the postcustodial archivist, Upward emphasizes that the "archival profession can no longer afford to be seen primarily as physical caretakers."[49] Upward explains that in postcustodial archives we should "focus on records as logical rather than physical entities, regardless of whether they are in paper or electronic form."[50] The archival document as a logical entity can be understood as including both the intrinsic value and the context in which it was created, which provides the basis for systemic value. Upward presents an ecological model by explaining that "archival documents are firstly documents embedded in action, and then are records disembedded from that action."[51] The records continuum, according to Upward, "is continuous and is a time/space

46 Ibid.
47 Ibid.
48 See Frank Upward, "Structuring the Records Continuum – Part One: Postcustodial Principles and Properties," *Archives and Manuscripts* 24 (1996), http://www.sims.monash.edu.au/research/rcrg/publications/recordscontinuum/fupp1.html (accessed 23 February 2007), and "Structuring the Records Continuum – Part Two: Structuration Theory and Recordkeeping," *Archives and Manuscripts* 25 (1997), http://www.sims.monash.edu.au/research/rcrg/publications/recordscontinuum/fupp2.html (accessed 23 February 2007). For more information on the records continuum model, see Sue McKemmish, "Placing Records Continuum Theory and Practice," *Archival Science* 1 (December 2001), pp. 333–59.
49 Upward, "Structuring the Records Continuum – Part One."
50 Ibid.
51 Ibid.

construct not a life model. No separate parts of the continuum are readily discernable, and its elements pass into each other."[52] This sentiment is echoed by Brien Brothman who believes the "[records continuum] offers archivists a break-hole out of the solitary confinement to which the life cycle metaphor has regulated them."[53] The records continuum is ecologically represented by Lindeman's trophic dynamic and his difficulty in categorizing the dying pondweed.

Upward asserts that the difficulties in moving toward a postcustodial model are due to the influence natural and physical sciences had on archival thinking at the end of the nineteenth century. These are the same developments that shaped preservationist and conservationist thought.

> Expressions of archival theory abound in organic metaphors, and emphasise the role of records in the objective and scientific exploration of the past. The object – the archives – was studied in much the same way as a Spencerian biologist studied the functioning of frogs by dissecting corpses or a Newtonian physicist searched for universal laws.[54]

Upward cautions us that viewing archives as an object is to view them as an absolute whole and not to see the various isolates. Archives are isolates we create, not absolutes, and we must not associate the material they contain as only belonging to any single isolate, or, that isolates are not intertwined and interdependent as Tansley underscored in ecosystems. Archives have systemic values with each other and thus individual archives cannot be considered an ultimate container. Upward views societies as the ultimate containers of recorded information, and that as a place in society, referencing Terry Cook, the archives is a multiple reality.[55] In turn, Cook describes the continuum model as encompassing movement across space and time, recognizing that archival records and their metadata are continually shifting, transforming, and gaining new meanings, rather than remaining fixed, static objects, and that this occurs in the purely archival fourth dimension.[56] Brothman emphasizes the continuum's betrayal of adherence to the "Newtonian ideas of absolute, linear time."[57] Thus, the continuum model embraces the ecological paradox of archives: to preserve systems that change.

52 Ibid.

53 Brien Brothman, "The Past that Archives Keep: Memory, History, and Preservation of Archival Records," *Archivaria* 51 (Spring 2001), p. 57.

54 Frank Upward, "Structuring the Records Continuum – Part Two."

55 Ibid.

56 Terry Cook, "Beyond the Screen: The Records Continuum and Archival Cultural Heritage" (paper presented at the Australian Society of Archivists Conference, Melbourne, Australia, 18 August 2000), http://www.archivists.org.au/sem/conf2000/terrycook.pdf (accessed on 23 February 2007).

57 Brothman, p. 56.

In his own work, Cook suggests that archivists changed over the past century from being passive keepers of the entire documentary residue left by creators to becoming active shapers of the archival heritage.[58] Cook identifies five themes that incorporate an awareness of the holistic relationships of records and act as a guide to approaching archives as an ecosystem.[59] First, as archivists continue to document cultural history, archives become more dominated by social history as expectations of them move toward collecting and protecting under-represented populations. Second, the archivist must intervene in the record-creation process, especially in an electronic environment, to document acts and ideas according to acceptable standards that protect relationships and provenance. Third, the selection and appraisal process shifts from the record itself to the act of creation, focusing on the context of a document or record's origin and asking why it exists. Next, he emphasizes that the archivist's hand must become more visible in the selection and arrangement process. The intervening role of the archivist influences how others view the information the archives contain; not to acknowledge this influence results in an inaccurate representation of the archives. Finally, the fifth theme explains that selection and appraisal are evolving theories with overlapping layers and simultaneously contradictory ideas. Cook concludes that

> By embracing this postcustodial and conceptual redefinition of provenance as the dynamic relationship between all connected functions, creators, and "records," archivists can develop an intellectual framework to address the challenges of integrating electronic records into their professional practice, of appraising complex modern records with acuity, of describing in rich context archival records in all media, and of enhancing the contextualized use and understanding of archives by their many publics.[60]

Archival work becomes a non-linear, dynamic process, unaffected by time and space. The postcustodial archivist concentrates on how archives are articulated and presented to their constituents, rather than viewing archives as cultural objects.[61]

Sustainable Models

The amount of information recorded in the last half century alone, both on paper and electronically, moves other archivists toward a new type of model that could be characterized as the sustainable archives. Sustainable develop-

58 Terry Cook, "What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift," *Archivaria* 43 (Spring 1997), p. 46.
59 Ibid., see pp. 43–47, for a more detailed description of the five themes.
60 Ibid., pp. 48–49.
61 Upward, "Structuring the Records Continuum – Part Two."

ment in agriculture and forestry advocates not only for the wise use of natural materials in a manner that preserves known ecological balances for future generations, it also promotes a "socially based" approach to ecosystem management. It is a shift from the existing utilitarian paradigm to a new environmental paradigm that values pluralism in both scientific application and social accountability. This need for accountability is the result of a growing dissatisfaction with traditional practices and an unwillingness to accept authority without alternate viewpoints.[62] Linking sustainability models to archival work demonstrates additional ways of thinking about archives.

Access to the information and the archival process itself is the primary factor in sustainable archives. Sustainable archives are less document focused and work to assure present and future users that the bulk of records will not inhibit access to information. Nor will archivists assume or say they are able to document a subject in its entirety. In the context of sustainable archives, Laura Millar sees archivists as auditors of evidence acting on behalf of society ensuring records will be protected and ultimately made available.[63] She also describes sustainable archives as a place for advocacy on behalf of the information they contain. Placing sustainable archives in the new environmental paradigm, Millar discusses archives as "part of the social fabric of society" and encourages "everyone to become involved in records and archives care."[64] The advocates of sustainable archives in the United States focus on the interconnectedness of information and criticize archivists' as yet unsevered ties to the document-focused appraisal, description, and preservation practices as barriers to access.[65] Their measurement of value by use is sharpened by the "democratization of access to collections," making "their practical value to the public a more pressing concern."[66] They reject saving an item for uniqueness alone and instead challenge us to conceptualize why we are saving the records we have chosen to acquire.[67] They require the archivist to demonstrate the "leading and trailing *ands*" of systemic value. It reveals the ecological role of the archivist in archives.

62 This interpretation of sustainable development in agriculture and forestry is explored in more detail in David N. Bengston, "Changing Forest Values and Ecosystem Management," *Society and Natural Resources* 7 (1994), pp. 515–33.

63 Laura Millar, "The Spirit of Total Archives: Seeking a Sustainable Archival System," *Archivaria* 47 (Spring 1999), p. 49.

64 Ibid., p. 59.

65 For a broader view of what I have termed "sustainable archives" in the United States see Ericson, "At the 'Rim of Creative Dissatisfaction': Archivists and Acquisition Development," *Archivaria* 33 (Winter 1991–92), pp. 66–77; Mark Greene, "'The Surest Proof': A Utilitarian Approach to Appraisal," *Archivaria* 45 (Autumn 1998), pp. 127–69; and Mark Greene and Dennis Meissner, "More Product, Less Process: Revamping Traditional Archival Processing," *American Archivist* 68 (Fall/Winter 2005), pp. 208–263.

66 Greene, "'The Surest Proof'," p. 154.

67 Ericson, p. 69.

Conclusion

It is easy to think of archival collections as individual organisms as Muller, Feith, and Fruin did over a century ago. Taken from their creator and placed in the archives, much of the context surrounding the material can be lost. Each collection becomes like an animal at the zoo. Each is safe and well cared for by the custodial archivist, each can be studied and researched, and yet each is in an artificial environment, forever separated from its habitat. If we understand archives to be small ecosystems containing dynamic chains of energy and representations of its non-privileged members, a new perspective comes into play. Interconnections between archives become more apparent; they become less like zoos and more like biomes, defined by their scope and location, much like climate and latitude. Archives as biomes are still an artificially designated container, but its boundaries are more socially defined, both by the creator and those that seek to describe it, rather than institutionally built like the zoo. The context and value are preserved.

It is impossible to draw a line around an ecosystem. It is simultaneously self-sufficient and interdependent on the entire globe. In the same manner, it is important to stop thinking of archives as the ultimate container for collections. They are only the isolates we created. The items in archives, so often viewed as the end point by both the archivist and the researcher, are actually only part of the system through which the human record passes. We interact with the materials and the ideas that created them or stemmed from them on a daily basis, both inside and outside the walls of the physical container of the archives.

Biological, social, and information systems are all dynamic and, in a postmodern sort of way, really have no history. Their pasts are never really separate from what is active and immediate.[68] Or more succinctly, all that exists is what there is. Yet through observation, we can see the dynamic process, the ability for energy to pass from plant A to microbe B, for information to pass from creator C to receiver D. It is precisely because of this observation and understanding that we see the whole is greater than the sum of its parts. We can see ourselves as a member of a system that is greater than us. In environmental ethics it is imperative not to harm the integrity or stability of the larger system upon which vital systems depend. We should develop policy with this in mind, to protect archival systems and to nurture their development.

In the same essay quoted at the beginning of this piece, Leopold observed, "we realize the indivisibility of the earth – its soil, mountains, rivers, forests,

68 Joel Wurl, "Ethnicity as Provenance: In Search of Values and Principles for Documenting the Immigrant Experience" *Archival Issues* 29 (2005), p. 70. Wurl is referencing the difficulties of group consciousness and collective remembering.

climate, plants, and animals and respect it collectively not only as a useful servant but as a living being, vastly less alive than ourselves in degree, but vastly greater than ourselves in time and space."[69] Archivists must realize the indivisibility of the cultural heritages dispersed across archival institutions and respond collectively through information ecologies that provide not only tools for the archivist and user to understand the larger whole, but a clearer understanding of the "why" of archives and the postcustodial role of archivists.

In his discussion of ownership and control in archives, Peter Hirtle reminds archivists that archival materials "are part of our common cultural heritage, and as such cannot belong to any individual or organization," and that "our task is to take care of the objects in our care to the best of our abilities. We have a responsibility to pass them along in good condition to our successors."[70] Reminiscent of Leopold's moral imperative at the beginning of this discussion, Hirtle returns the archivist to the core concepts that drive theory and application in archival thinking, placing archivists next to environmentalists under the umbrella of preservation, conservation, and ecological holism.

69 Leopold, p. 95.

70 Peter B. Hirtle, "Archives or Assets?" *American Archivist* 66 (Fall/Winter 2003), pp. 242–43.