Power of Position

Classification and the Biodiversity Sciences

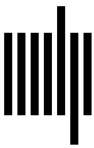
By: Robert D. Montoya

Citation:

Power of Position: Classification and the Biodiversity Sciences
By: Robert D. Montoya
DOI: 10.7551/mitpress/12245.001.0001
ISBN (electronic): 9780262369961
Publisher: The MIT Press
Published: 2022

OA Funding Provided By:

OA Funding from UCLA Libraries/TOME



The MIT Press

INTRODUCTION

AN IMPERATIVE AND INITIATIVES

In June of 1992, a meeting of nations, collectively called the Earth Summit, gathered at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, to discuss pressing issues facing the sustainability of biological life on the planet. An outcome of this meeting was the adoption of Agenda 21, a "wide-ranging blueprint for action to achieve sustainable development worldwide" (United Nations 1997, 2017). Topics at the summit included the lack of access to potable water across the globe, the increasing use of fossil fuels, the expanding production of toxic waste, and the decline of earth's biodiversity due, in large part, to the detrimental influence of human activities on global ecosystems (United Nations 1997). An important international treaty arose from this summit, the Convention on Biological Diversity (CBD), which articulates the critical need for coordinated scientific information-exchange infrastructures to better understand and reverse the globe's diminishing biological diversity (2016). A core focus of the CBD is the general acknowledgment that the fruits of biodiversity research (data, nomenclature, species lists, taxonomies, and the like) are much more than "merely" the identification of "plants, animals and micro-organisms and their ecosystems" (Convention on Biological Diversity 2017b). This knowledge also has radiant, derivative influence across many disciplines, and thus has an increasing pertinence to, and impact on, global populations in all corners of the planet (*all* biological populations, including, but not limited, to humans).

The historical impact of this document has been significant, for it serves as the motivating and pro forma international agreement on which numerous biodiversity and ecological initiatives have built endorsement for their respective projects. On a local level, the CBD has spurred the implementation of laws and policies that govern a number of domains pertaining to biodiversity issues (Kate 2002). The CBD has arisen at a watershed moment in biodiversity-related data practices, in particular, and has acted as a catalyst for the production of numerous centralized data repositories intended to bring together localized knowledge sets within openly accessible, global infrastructures to facilitate information exchange. In particular, Article 7 of the CBD explicitly acknowledges the importance of maintaining and organizing data derived from the identification and monitoring of biological diversity (1992, 5).

Building on this acknowledgment, during the 1998 Conference of the Parties—the governing body of the convention—national participants articulated the Global Taxonomy Initiative (GTI) to address what they referred to as a prevailing "taxonomic impediment" (Convention on Biological Diversity 2017a; Hopkins and Freckleton 2002). The impediment cites a "shortage of taxonomic expertise, taxonomic collections, field guides, and other identification aids," caused, in part, by the general difficulty in accessing existing taxonomic information (Convention on Biological Diversity 2003, vii). According to the CBD, the GTI marks "the first time in history that taxonomy has had recognition at such a high level in international policy" (2003). Given the CBD's articulated concern with the fragmented nature of biodiversity knowledge, the GTI articulates clear steps by which authoritative online platforms should collocate regional taxonomic information by strengthening "regional cooperation" (2003, 1). Locally specific biodiversity knowledge has historically been stored in site-specific ways throughout the globe, effectively unavailable to the larger scientific population for integrative work. Researchers have also generally been (and continue to be) trepidatious, flatly unwilling, or technically unable to share their data. Yet, given the reality that grant-based and governmental funding is limited and in high demand, centralizing data in large databases—and thereby centralizing activities such as species

naming and describing and taxonomy building—is one approach scientists can take, collectively, to sustain a long durée approach to biological taxonomy (Ribes and Finholt 2009; Thomas 2009). Thus, in response to the Global Taxonomy Initiative's call, large-scale federated platforms have begun to gain operational steam, aggregating taxonomic and descriptive data with the eventual goal of unifying all geographically specific caches of biodiversity knowledge (Bowker 2008, 120; Waterton, Ellis, and Wynne 2013, 108).

Despite the existence of initiatives such as the GTI, and the multitude of newer initiatives that have arisen since the initial 1992 gathering, global biodiversity continues to decline, in part because of large-scale global phenomena such as climate change and global warming, suggesting that there is far more work to be done (Bellard et al. 2012; Butchart et al. 2010). Gaining a more robust understanding of the biodiversity of the planet is a pressing scientific task if we are to understand the full impact of this new ecological reality. However, the ability for scientists to study and understand the scope of ecological issues—especially global ones—rests on the scientific community's capacity to name, document, and classify, and then *communicate*, our collective knowledge about what species exist on the planet and how these species are being affected by these new conditions. As we will learn, aggregating species information is no easy task, nor is aggregating this information into *normalized* systems across numerous research teams. This normalization of data format presents various structural and epistemic problems; by taking a global view of data, we can begin to consider how we might solve problems that exist on a global scale.

Thankfully, many recent scholars have identified the importance of understanding the operationally and technologically focused aspects of the biodiversity sciences. Each of these scholars notes that, if we are to aggregate appropriately, and with respect to the constitution of scientific knowledge, we must also attend to the data practices and resultant social epistemological impacts of collective taxonomy production. This increasing focus on data and information in the domain has been described by Catherine Kendig and Joeri Witteveen as a burgeoning "information science turn" in taxonomic studies (2020). In a comprehensive special issue

of *History and Philosophy of the Life Sciences*, Kendig and Witteveen bring together a group of scholars to examine how taxonomic practices (vis-à-vis information control) intersect with the scientific procedures of communication, naming, and taxonomy. So, while the practice of aggregating data within the biodiversity sciences may seem innocuous and somewhat neutral to the general reader, the reality is that this work has significant impacts on taxonomy as it intersects with the domains of ontology, epistemology, and, as we will find, on the circulation of power and control within these classification systems. This book follows a long line of empirically informed research such as Sabina Leonelli's, *Data-Centric Biology: A Philosophical Study* (2016), and Christine Hine's early study, *Systematics as Cyberscience: Computers, Change, and Continuity in Science* (2008). What both of these scholars illustrate is that within the fields of systematics, biology, and taxonomy, the practices of organizing and building systems of knowledge—"making science happen," so to speak—need to be attended to if we are to understand the rapidly increasing effects of technology on the constitution of scientific ideas as a historically contextualized, socially affective, and epistemologically nuanced phenomenon.

The problematics of coordinating and producing such taxonomic infrastructure for biodiversity, however, are numerous and complex, particularly if we look more closely at the specific technological databases that have arisen to aggregate classification and taxonomic information. In the last twenty years—spurred on by, if not created as a direct result of, the CBD's articulated aims and directives—new federated digital initiatives such as the Global Biodiversity Information Facility (GBIF) (2017) and the International Barcode of Life (2015; Waterton, Ellis, and Wynne 2013) have taken on the management of worldwide biodiversity data toward the end of universal and standardized access. These and many other information systems are collectively used in scientific research to direct global biodiversity initiatives supported by governmental and nongovernmental organizations toward the development of policies, as well as to make decisions for issues as far reaching as climate change research, global health initiatives, and conservation assessments (Jetz, McPherson, and Guralnick 2012, 151). Yet, as our contemporary political period has soberingly illustrated,

while classification data are used as decision-making variables in public discourse, we cannot assume that the nonspecialists and governmental officials who use them as tools for the articulation of policy and law, for example, will have the capacity—or frankly, the ethical principles—to understand what these classifications can and cannot tell them and to invoke them responsibly.

This is the gist of the problem this book hopes to address: that classifications are powerful mechanisms in our information-rich world and that we must better attend to the machinations inherent in this power, as well as to how the effects of this power proliferate beyond the boundaries of their original intent. I emphasize power as a core analytic because classifications are nothing if not systems that relate one entity with another—a task that inherently requires individuals (or, more detrimentally, algorithms) to value an entity's relative importance (by way of its position) within a system of other entities. Classifications involve two spaces of concern: an internal, representational space that depicts species relationships (a classification of canids, for example), and a material space that produces effects on external bodies, such as natural organisms, people, and communities, in that how it represents them impacts their identity and possibilities in the external world. For example, classifications have a great deal to say about how much power society, or a government, might or might not have over nature. Classifying the Great Green Macaw (*Ara ambiguus*) as an endangered species in Costa Rica, as a case in point, has made it a species worthy of conservation, thereby (potentially) offsetting the rapidly dwindling numbers of birds in the Monteverde Cloud Forest. The same can be said of the contested dingo of Australia, though the jury is still out on whether it deserves protection as a species or whether it should be eradicated as a pest. Shall we continue to kill dingoes on account that they are an ecological pest? To some, perhaps. Such decisions partly depend on what their scientific name is (and by extension, what taxon concept it represents)—on their *position* within some reference classification. For obvious reasons, these results can be destructive to our ecosystems, but these classifications can also, in a roundabout way, be a mechanism that provides agency to a species that would otherwise have no legal or cultural protections over

its being. Organizations like the International Rhino Foundation and the World Wildlife Fund work daily to bring attention to species that need a voice in a global space that views species as commodity, capital, and game.

Inverting this emphasis, classifications can equally be said to have power over us (humans) and direct our actions in relation to nature. As in the examples above, they most obviously tell us what we can and cannot do with respect to certain species. Classifications either restrict our agency over nature or increase our capability to extract value from it. On top of this, however, we also see *through* classifications, often darkly. They help define nature for us by way of visual and representational cues, but the terms of those definitions may be unclear or impossible to unpack. Nature, after all—whatever this term might mean to any individual—is a complex concept, full of interrelated organisms that are not easy to categorize into neat and discreet species and taxon groups. Nature is also a space to immerse ourselves into and enjoy, but it is also a resource that must be exploited to survive. The extent of this exploitation exceeds what we need for mere survival, of course, since our global population has, in no uncertain terms, made a disaster of our biological ecosystems in exchange for luxury, mobility, and expansion.

More subtly, biodiversity classifications have an innately epistemic power over us. They position our own sense of identity in relation to *the natural*. That relationship is often anthropocentric, as can be seen in the long history of the natural sciences. The Great Chain of Being had human—often, more specifically, "l'homme"—categorized just below the divine. Animals, in Aristotle's view, were to be ranked above plants, given that they sense, breathe, and move. And downward the hierarchy proceeds through quadrupeds, birds, lichens, rocks, minerals, and so on. Biodiversity classifications narrativize nature and give us entree into its complexity by way of simplification and individuation. If everything was not "named" (as a species, a plant, an animal), then we could not communicate our relation to it. It was thus why Hope Olson (2002) was able to declare that power is in a name—that the act of naming itself creates entities that can either be foregrounded in our imagination, pushed to the background of our thoughts, or forgotten altogether within a system of other names

that, by virtue of their appearance, are more valued than those which we (actively or passively) choose to obfuscate. To say that classifications *merely* mediate between information and a broader public (scientists, policy makers, conservationists, and the like) is to hopelessly fall into an antiquated information-as-conduit discourse. Classification systems are more than a "service" for a user. The relationship between a system of organization and its user is reciprocal: we may produce classifications, but those classifications also affect our ability to make sense of the information contained within it. In describing the user's relationship to information, Ron Day posits "a model that views subjects and objects as co-emergences mediated through co-determining, contextual (or 'structural') affordances and through in-common zones of mutual affects" (2011). The subject (the viewer of the classification) and the object (the classification itself) are linked in complex and processual ways.

SOCIONATURALITY

The reality that organisms live out in nature as pure and clear-cut named individual taxon groups is a fiction, and one well-known by the scientists charged with naming and classifying species taxa and other taxon ranks. Things do not emerge with names—it is our language and our need to communicate ideas that require us to go about this operation of naming. Nor is the idea that humans—positioned as we are in our own infinitesimally small spot on the tree of life—stand apart from nature in some way a natural circumstance. On one hand, this seems like a very obvious point, yet on the other, most individuals navigate our information ecosystems as if the categories, labels, names, and information structures they navigate are a given. Google results are seldom questioned by the general public, for example. As Judith Butler notes in *The Force of Non-Violence* (2020), figures such as Hobbes and Rousseau present a history of the world that begins with the individual. To illustrate this, Butler presents the fiction of "Robinson Crusoe, alone on an island, providing for their own sustenance, living without dependency on others, without systems of labor, and without any common organization of political and economic life" (2020, 31).

The story of history (and of political economy, for that matter) just kind of "starts there," as a man on an island struggling to fight the onslaught of the natural world. That is, until other individuals arise whose interests conflict with his (and it always is "his") "individual" nature. Society then grows more complex, and individuals must engage in methods of economic exchange, and they are forced to pit their interest in relation to, and against, all others. Social and racial contracts arise, intentionally tempering conflicts through tacit agreements, monitored by our own adherence to the contract or by way of social norms, law, policy, and so on (Rawls 1999; Mills 2011). Yet the true reality, as Butler notes, is that we are nothing if not born into a world of dependency, both as a child and throughout our life as we navigate an environment that, through no deliberate choice of our own, we depend on to subsist through its myriad resources (for food, for shelter, and so on). When we are born, we enter into a world that is not, as we often assume, naturally divided into two components: one of "society" and another of "nature." Rather, we emerge into a reality that is socionaturally entwined into an endless net of what Butler calls "radical dependencies" (2020, 41). It is from this perspective that this book's narrative emerges—that the process of classification and representation broadly separates, rather than connects, our selves with regard to species.

Attending to this assumed bifurcation between nature and human, I think, is particularly important in this moment in history that, if we want to be generous, is at best tumultuous, or at worst, apocalyptic. Some have called this era of systemic change the Anthropocene—a moment when the world has been so drastically altered by humanity's impacts that we have altered the very systems that have steadily maintained life on earth for millions of years. I can imagine no entity more vulnerable at the moment than the natural world and the cycles that define it. Ecosystems are out of balance and global warming continues to worsen, even while governments ignore its existence. At the moment of this writing, each year seems to bring a new record-setting march of hurricanes across the Atlantic Ocean. Glaciers are detaching from permafrost areas at a rate too astonishing to comfortably acknowledge. In one season, the ecosystems of Australia are destroyed by wildfire, while in another it is Greece or Brazil; I am currently

writing in the thick, unbreathable air caused by fires on the western coast of the United States. The occurrence of the next catastrophic fire is not a question of if, but when. There is no end in sight.

Others have maintained that to merely declare these impacts to be human driven overlooks the fact that not all humans have contributed to this disaster evenly. "Capitalism, not industrialization," as is commonly articulated, "caused the Earth's transformation by producing massive social inequalities that supported 'audacious strategies of global consequent, endless commodification, and relentless rationalization'"—a process termed the Capitalocene (Ellis 2018, 136; Moore 2016, chap. 1). This is to say that the effects of the Anthropocene, Capitalocene, or whatever other term you might adopt, are unavoidably political. Any new era (or "—cene," as the case may be) is defined by massive shifts and radical biological changes, such as the massive biodiversity loss and extinction events that we are experiencing at the current moment (Moore 2016, 21).

Were it not for the work of biodiversity scientists, and the species lists and classifications they carefully produce, we would have no measure of this loss, nor a language with which to name what we lose wholesale in the process of this change. And, if one of the capacities of biodiversity classification is to help us imagine what nature is, it can then be a prime site wherein humanity can reimagine what it means to be human in a more intimate and ecologically focused way. Now, more than any other time in history, naming species is of the utmost importance, if only so that we can mourn their disappearance and force ourselves to see the direct and specific human effects of our unjust actions toward our environment. As appropriately stated by Manuel Arias-Maldonado, "Of course, animals occupy a key position in the human-natural relation. Actually, they perform an important propagandistic function, in that certain animals—aptly called 'charismatic' ones—symbolize the plight that all of them suffer under human dominion" (2015, 106). Nomenclature and classifications have a heavy responsibility in this tumultuous time by representing organisms both big and small for the equal and distinct value they hold in our ecologies.

My intent here is not to descend into the depths of environmental despair, easy as that may be these days, but I do want to express that the

presentation of biodiversity information, especially in the guise of graphical classifications, has a large role to play in this time of ecological change. As stated above, centuries of classification work have held humans to be the apex of the natural world, and this deep-seated cultural belief is still alive and well, even while our scientific classifications change to represent more connectivity. So, while this naming of species is necessary, as is the construction of the classification systems that express them, these processes also simultaneously distance us from nature. Nature is delivered in neat packets that summarize the state of nature as if it is complete and naturally ordered. These technologies help us "exert control over nature, complicating the socionatural relation at the same time, while also being key . . . for redefining that relation in a sustainable or even more caring way" (Arias-Maldonado 2015). Whether these classifications are used to control and exploit or to nurture and heal is based, in a large part, on the way we present their content as either definitive and distant or fluid and relational.

What I mean by this is that classification builders can and should collectively work to emphasize ecological points of view, over views that might otherwise make nature seem like the "other." As also noted by Arias-Maldonado (2015, 8–9), the study of "nature" proper has become multidisciplinary, studied in areas far outside the boundaries of the natural sciences, from the environmental humanities to sociology, economics, and information science. Nature as an entity of study is not only the domain of the empirical sciences, in part because other areas of study note how nature has a part to play in each aspect of our lived experience: in our imagination, in our social circumstances, in the production of our social inequalities, and in the facilitation of our individual powers and abilities to improve our position in society. To understand the broad impacts of biodiversity classifications, we must also understand that their influence is not only representational and inert; they are also complex and nuanced entities that are built to do both practical and epistemic work in the world—quite apart from the fact that we may or may not fully intend for them to be used in one way or another.

Woven into the narrative of this book, I make the case for a few theses:

- Biodiversity classifications, and the entities they organize, are constructed, artificial entities, yet they are popularly often seen as given and "correct." This is not to say that they are scientifically invalid, but it does mean that their epistemic realities are built and not given.
- The natural world is process-oriented, and how we identify entities within it (taxa, species, and the like) will differ depending on our epistemic orientation, which poses challenges in spaces such as in the case of the Catalogue of Life.
- Biodiversity classifications have epistemic and material impacts in the world that radically impact individual and collective being (human and nonhuman alike).
- Universal biological classifications are a detriment to the future of our knowledge space.
- Biodiversity classifications, thus, have a role to play with regard to ecological and environmental justice.

The social powers that classifications exhibit in the lived, social world are ontological, organizational, epistemic, and historically situated. To better understand this power, we must idealize ways to frame how this power is exerted in concrete and manufactured ways. To this end, classifiers have a certain obligation to express how these classifications fit within the broader field of social use and the contexts within which they will function as tools of decision making. So too do the users of these systems, who need to unpack the nuances of their construction.

This narrative, then, is just as much about the social impacts of biodiversity classifications. The overarching argument of this text is that, first, classification systems, in general, are instruments of power, and that, second, within the biodiversity world, this means that biological taxonomies are inherently caught up in the practical and political work of quantifying nature, which influences how the scientific and social world envisions, questions, contains, and liberates the natural entities that we identify in the world. The aim is to better understand how contemporary modes of data aggregation—a relatively new phenomenon in the biodiversity sciences—influence the production of scientific activity as well as the interpretation

of the natural world to members of the public, who are increasingly using these interfaces to access data on the natural world.

The above theses can be tweaked to map how these ideas can be generalized to refer to all classifications, and how they function in social space.

- Classifications, and the entities they organize, are constructed, artificial entities. We can have many multiple valid classifications functioning at one time.
- The social world is complex, and to attempt to reproduce its identity in systems will implicitly reduce the world to match the point of view and social assumptions of its builder.
- Classifications have epistemic and material affects in the world that radically impact how individuals can negotiate their being in society.
- Universal classifications are a detriment to the future of our knowledge space, even considering their parsimonious and standards-based approach.
- Classifications, thus, have a role to play with regard to social, cultural, and epistemic justice.

Extending this argument, my goal is to emphasize the extent to which these classifications are constructs that could have been otherwise, had we approached any one of them with a different mechanism for quantifying entities (by size, by shape, and so on) and a different theory for articulating their boundaries. Which is also to say that the "species" that we recognize within classification systems are not "real" or given categories in the natural world: there may be an *entity* we call the Great Green Macaw, but that entity might have previously been identified as some other species. And were we to take a different epistemic point of view, we might even more strongly associate that Great Green Macaw as less a species and, more importantly, as a spiritual entity, or an entity that protects the air and winds, as is the case in some indigenous tribes. What I call *derivative positionality* is critical here: how an entity is positioned within a classification (derivatively) has powerful implications over how that entity is positioned in the lived, material, and social world. And one way to offset and regain control over this social and material power is to expose how that classificatory position

is not, in fact, fixed but can be conceptualized in many different capacities in different epistemic contexts. For every classification that we encounter, an equally valid classification could present itself.

Finally, I explore how we can think about complexity and plurality in these spaces. If classificatory positions are not assumed to be fixed, given that one entity might inhabit many different positions in different classifications schemes, we need to propose a mechanism by which we can expose this fluidity. We should work toward creating classifications that also allow for the radical possibility of upsetting that assumed order and imagining new arrangements such that socionaturality and fluid boundaries are exposed rather than obfuscated. Positing pluriversality is, in part, to imagine otherwise, and so we must attend to how we can connect the given with the absent, and the expected with the unexpected. And so, if the process of classifying is disentangling nature into its constituent parts and ordering it in ways that make sense to our epistemic understanding of the world, as affirmed by Butler (2020), what does it mean to *re-entangle* nature to imagine new possibilities that illustrate a dependency-forward way of perceiving entities?

A DERIVATIVE APPROACH: COMPOSITE CLASSIFICATIONS

The central portion of this book examines the case of *composite taxonomies* as a springboard from which we can concretely understand the epistemic limits and potentials of classifications. Composite taxonomies, to state it somewhat reductively, are understood in this project as *derivative taxonomic arrangements that aggregate multiple, subsidiary taxonomies into one universalizing space*. The Catalogue of Life (abbreviated henceforth as CoL or the Catalogue) will serve as the primary example of this type of classification. The Catalogue asserts itself to be an authoritative, management-oriented biodiversity schema that is designed to serve two functions: to provide (1) a single, integrated, and validated species checklist, and (2) a management hierarchy (classification and taxonomy) that can bring together data from different sources representing different taxonomic commitments into one hierarchical design (Species 2000 2017a). Any and all classifications are

complex in their own right, but entities like the Catalogue are especially so, since they bring together potentially conflicting schemas that must be edited to the organizational, data-management-oriented commitments of the Catalogue's space.

Aggregating taxonomies in this fashion is not apolitical work, nor is this approach universally recognized by the broader taxonomic community as an effective means of aggregating taxonomic data. Conflicts arise as practical and pragmatic approaches to data collection and collocation are positioned in tension with the hermeneutic and hypothesis-driven work of scientific taxonomic production. The former obfuscates and confuses the empirical work of the latter. If you are a trained biodiversity scientist, such an editorial approach might trigger a (quite reasonable) body-cringing response. Each taxonomy, generated by every scientist or team, is produced under a certain set of intellectual conditions: assumptions about what constitutes a taxon concept, as well as the engrained suppositions about how these concepts should be related based on any number of morphological, genetic, or ecological traits. These assumptions are both metaphysical and ontological (as in, what *kinds* of things exist in the world, and how do they relate), as well as epistemic (in that the classifications are constructed under assumptions about what represents a true and valid representation of the natural world). Systems of any kind, and taxonomic classifications no less, are contingent historical reconciliations, based on current and present knowledge sets that maintain an equal footing in the laboratories "of the past" (Rheinberger 2010, 89–90). Pick a taxonomy—any taxonomy—and you will find a network of knowledge that represents years and perhaps decades of layered and accumulated information, research, and hypothesis formulations.

Despite this unavoidable and complicated reality, the Catalogue has taken upon itself the commingling of these diverse and multiple taxonomic constructions into one unified space. Yet, the Catalogue's stance is that *information must be shared* in order for biodiversity knowledge to reach its full research impact and potential. And to reach this potential, standards need to be implemented, even if contributed taxonomies must be manipulated to cohere with global data standards. Concerned as the information studies (IS) community is with pluralistic approaches to classification

(Mai 2011; Szostak 2015) and the representation of diverse voices and fluid ontologies in and for our information systems (Seddon and Srinivasan 2014; Srinivasan et al. 2009; Srinivasan and Huang 2005; Srinivasan, Pepe, and Rodriguez 2009), spaces such as those inhabited by the Catalogue can be incredibly instructive toward these just ends, if nothing else as provocative starting points for discussions about what plurality should and can look like in practice.

But this is just one part of the story: as a management classification, the Catalogue is also integrated into other systems as core organizational architecture. Once the Catalogue is compiled, it is subsequently embedded into a network of other biodiversity systems, thereby amplifying its effect across the landscape of biodiversity practice. And given that contemporary database taxonomies are now the main source of taxonomic knowledge, the consequences of this activity can be globally consequential (Hodkinson 2011; Parr et al. 2004; Watson, Lyal, and Pendry 2015, chaps. 2, 9).

DISCIPLINARY FRAMING AND THE BROADER CONCERN

A note must be included about the disciplinary gaze of this book—that it is derived from the field of information studies is significant. "The world is full of writings," wrote IS scholar Patrick Wilson, "Most are only of passing interest to anyone, despite their being records or traces of human activity; not all of our history is worth remembering" (1968, 1). While often flying fairly low under the academic radar, the domain of IS has been of great consequence to each and every facet of scholarly production. Any scholar working within an academic setting since, conservatively, the late nineteenth century has been implicitly producing scholarship with the books, data, documents, and objects that librarians, archivists, data experts, and museum curators have found *fitting* to preserve as a representation of human activity. This statement may seem bold, but to my mind, its heft is warranted and unequivocally true. For every "discovery" made within the limits of an archive, museum, or library, there is a long line of individuals, including a librarian, archivist, or museum curator, who *chose* to save an item for posterity.

One might recall the repartee between the historian of science and technology Suzanne Fischer (2012) and freelance researcher and former librarian Helena Iles Papaioannou (2012) regarding a Lincoln report found in the US National Archives. At the center of this argument was a medical report on Abraham Lincoln sent to the then US surgeon general by the first doctor to arrive at Ford's Theatre after the president was shot by John Wilkes Booth. The report was, as you might imagine, housed in the surgeon general's records at the National Archives, filed under "L," for the name of the doctor, Charles Leale. News reports of this (no doubt) important document touted the letter as being "discovered," "unearthed," "rediscovered," and "found." Fischer's opinion was that no document is "discovered," and that it was just where it should be: where an archivist had put it. Papaioannou then responded, claiming that no archivist knew of the report and that its existence was, indeed, unknown, making discovery possible. "The title of [Fischer's] article ["Nota Bene: If You 'Discover' Something in an Archive, It Is Not a Discovery"] suggests it is impossible for a researcher to make an archival discovery," Papaioannou wrote (2012).

In most cases, I'd probably remain neutral on this argument, given the somewhat tedious nature of arguments of this kind, but there is no scenario in which "discovery" is an appropriate term. As a librarian who has worked in academic libraries and archives most of my career, I know the energy it takes to convince countless researchers of the worth of information professionals—a Sisyphean feat. If anything is to be discovered, it should be the institutional arrangements of power that facilitate the acquisition, appraisal, maintenance, and preservation of collections. What researchers do accomplish, of course, is articulate the social worth of documents within their discipline at particular points in time. That Papaioannou brought the letter to the public as part of a research endeavor is incredibly important: the document did, indeed, shed new information on a matter of immense historical import. This contribution should not be discounted or undervalued, and I hope that is clear to all readers, including those involved in this controversy. The nuance in Papaioannou's argument is that the letter was not catalogued at the item level, nor was there any documentation regarding the decision-making process that led to keeping *that individual letter*. Given this, it is

unlikely that an "appraisal decision was made on any particular document" within the surgeon general's records (Papaioannou 2012).

The reality, however, is that just because a process is not documented does not, by default, mean a process of selection did not take place. The document is *there*: it is in the archive, and that should be documentation enough to support that the item was, in fact, curated to be just where it is. To assume this to be the case is the professional courtesy I give to those who worked hard to preserve it. Surely, an archivist may not know of the true value (if such a concept exists) of a document at a given point in time, within a certain discipline, but that does not stop them from performing due diligence to foresee what might be important to current and future scholars. Archivists are not prescient, and certainly are not experts in all fields. They value collections by using context to the best of their abilities. In this case, the surgeon general is an important historical figure, and thus, their collection typically merits archiving. Archivists are professionals trained to manufacture clarity from within the countless number of documents produced during the course of daily activity. As Wilson said, "Not all of our history is worth remembering." Information professionals, nevertheless, take it upon themselves to manage the impossible task of crafting cultural memory and assigning value to the voices of some and not others. It is not easy, but it must be done.

I begin this section on disciplinary framing with this story because it shows why IS is such an important, if undervalued, discipline in the academy. It doesn't matter whether we are talking about a document in the archives of the National Library or a type specimen of a biological species from the Central American tropics in the London Museum of Natural History. There is a story behind each concerted decision to collect each and every object, and this decision-making process matters when we think about the scholars who generate scholarship by using these collections. Thus, the power of what can and cannot be integrated into ongoing scholarship is an unavoidable reality of information work. Librarians, archivists, and curators are poised daily to make decisions about what other evidence disciplines will use as the basis for their ongoing theoretical and methodological investigations.

But IS is more than the institutional activities that we recognize as information work. The discipline also brings with it a rich and critical mode of engagement with information that merits broader appeal in adjoining disciplines. IS a broad term that, in the context of this book, is inclusive of information science, an umbrella term covering many of the data-oriented domains that have arisen in recent years, such as informatics and data science. The use of the term "studies" in information studies is vital, because my approach is far more humanistic and cultural in its constitution than one might otherwise assume when thinking about "information science" proper. And certainly, if one looks to the content of data science programs—seemingly ubiquitous, popping up in departments ranging from business and economics to statistics and artificial intelligence—what is often lacking in them is a critical focus. By critical I mean an approach that examines objects of interest with an eye toward embedded power structures, ethical possibilities, and just ends. Surely there are exceptions, but these exceptions do not define the business-driven Silicon Valley mentality that pervades the typical approach to "data" in these many domains. And this mentality is dangerous to our health as a collective community.

The field of library studies is important to highlight here as well, especially since social justice and activist-oriented values have long been a central part of the profession. The American Library Association holds values such as "access, confidentiality/privacy, democracy, diversity, education and lifelong learning, intellectual freedom, preservation, the public good, professionalism, service, social responsibility, and sustainability" as core values to librarianship. In library studies we strive to uphold one's individual right to epistemic freedoms, emphasize community experiences and concerns, and prioritize globally comprehensive notions of truth and justice.

A Comparative Approach

My approach in this book is comparative, in the sense that I am looking to biological classification in hopes of understanding some general epistemic qualities about what it means to classify *at all* in our contemporary world, and the effects these qualities have on social spaces (Danton 1973). This approach is obvious in the narrative, in that I bring to bear examples from

both the biodiversity world and the "traditional" library world. But to be clear: my goal here is not to postulate a "general system" of classification—in that my examinations should somehow hint at some fundamental, normative techniques—nor do I claim that there are universal ways in which to understand classifications. To do so would be antithetical to the purpose of this book. However, I do think that the differences between library and biodiversity classifications, in terms of both theory and practice, can help us envision solutions that best situate classifications with more pluralistic capacities. The reality is that what constitutes scientific knowledge has always been contested. In the biodiversity sciences, some groups hold epistemic values that are in contradiction to other groups. This is the sign of a healthy discipline, focused on pushing the limits of our understanding of nature.

The comparative approach is also vital if the fields of classification studies and IS are to better understand the lasting and often-repressive effects of major epistemic cultural shifts such as colonialization, capitalism, and globalization. In this sense, I see the comparative method as a core approach to a critical study of representation systems, insofar as the method can tease out how super-structural modes of power (culture, politics, law, education, and so on) express themselves in the domain of librarianship by way of organizational, descriptive, collection, and access practices mediated through various technological and epistemic instruments. It is useful, as well, to exit our spaces of disciplinary comfort to find surprises in these distinct domain specificities. My argument here is that we need more of this work, for the situated, contextually specific, and historically contingent attributes of these knowledge systems can inform, broaden, and render more pluralistic our understanding of classification and knowledge organization in general. Such work, I believe, is vital to the longevity of the discipline of IS.

There is also a historical precedent for this approach. As Ronald E. Day states, "Universal bibliographical classifications and descriptions followed the example of zoological taxonomy and classification in the century before them" (2014, 39). Seen in this light, this project seeks to return back to these roots, to reengage IS scholarship in the organizing endeavors

and practices of the natural sciences. Taking a close look at the practices of biodiversity scientists in relation to practices in information studies isn't an altogether strange juxtaposition, for, as David Hull states, "as most people view taxonomists, they are more librarians than scientists and just as loveable. . . . Collectors and classifiers were the ones who had sufficient knowledge to appreciate the true diversity of life" (1988, 81).

In IS, our aim might be to organize books, documents, or data, but the classificatory assumptions we use for any particular system are anchored only by the artificial boundaries and suppositions imposed by the classifier. The Library of Congress, for example, is organized by discipline. Class B contains works on philosophy, psychology, and religion, while Class Q contains documents related to science. Books and documents are not created out of a naturally occurring system or ecology to ascertain the extent or boundaries of our classificatory possibilities. The artificiality of classificatory systems is, in part, what drove Hope Olson, in her influential text, *The Power to Name: Locating the Limits of Subject Representation in Libraries* (2002), to push against the "fundamental presuppositions" on which our information practices rest. (In Olson's case, she was focusing on subject representation within library systems.)

In the biodiversity realm, however, there certainly is an extent to which the "real" world plays a fundamental role in how and why we classify things the way we do. Biodiversity classifications are unique in that they engage with ostensibly natural-occurring objects that can be empirically examined and assessed for subsequent coordination in classifications. Biological objects can be assessed in many ways, using any number of traits: morphological, genetic, ecological, and so on. However, even though the act of classification is empirically grounded, there is no still no presupposed, natural order that can be naturally translated into representational classifications. Biological classifications are *arguments* in support of a certain arrangement of classes. Classifications are models, not mirrors. Each scientist will have a different take on what natural taxa exist and how these taxa are related to one another. This distinction between documentary and biological systems is a key one to keep in mind. The contrast between these disciplines, and how they verify their classificatory arrangement, can tell us

a great deal about the subjective and representational qualities of representational systems more broadly speaking.

So, make no mistake, this book may take biodiversity as its main topic, but in service of exposing the mechanisms within classifications that make them such powerful cultural constructs. The problematics discussed in biodiversity classifications—and the possible ways forward I articulate—are applicable to any and all classification systems. Every classification exerts power, and so the lessons learned in this space are applicable to all similar representational environments.

Finally, one danger of writing a book about biodiversity science as it intersects with technology is that, after a short time, the cases represented in the book will become outdated. With that in mind, I have done my best to frame this narrative in terms that are, hopefully, more conceptual and less temporally located. There is certainly a danger that this approach may present the process of science in too condensed a fashion, or it may appear that I do not give full and proper justice to the complexity and nuances of the work of biodiversity scientists. It is important to note that what many biodiversity taxonomists take as obvious—that taxonomies are constructed and artificial, for example—may not be as clear to practicing IS professionals, or to the public at large. My approach here is to straddle the line between professionals and broad audiences that may not be aware of the disciplinary approaches of taxonomic work. Similarly, my delivery of the theories and literature of information studies may be equally reductive and, thus, may gloss over some of the divergent opinions in the field, especially in relation to issues of control and power broadly conceived. Throughout, I hope my respect for this biodiversity work is readily apparent. I am in no way presenting a case that intends to downplay the importance of biodiversity classification work or to claim that it is messily arbitrary. It is a science that produces taxonomies that are testable hypotheses. But even scientific practices are human at their core. The sciences are a series of epistemic cultures (Cetina 1999) that are subject to rupture and change over time (Kuhn 1996). It is the influence of cultural norms on the practice of science that interests me, much the way culture also influences the practices in IS. My goal is to show that, in fact, interpretative acts are exposed in

the act of delineating and circumscribing species, and that within these moments of exposure we can better understand how concepts change, not only within the domain of science, but also within other areas of import, including classifications as they exist in IS.

CHAPTER TRAJECTORY

The chapters roughly follow the trajectory outlined in figure 0.1. Building on Patrick Wilson's notions of descriptive and exploitative power in *Two Kinds of Power* (1968), I invoke a deconstructing analytic that imagines the space of classifications to be (roughly) constituted by modes of power at the following levels (see figure 0.1):

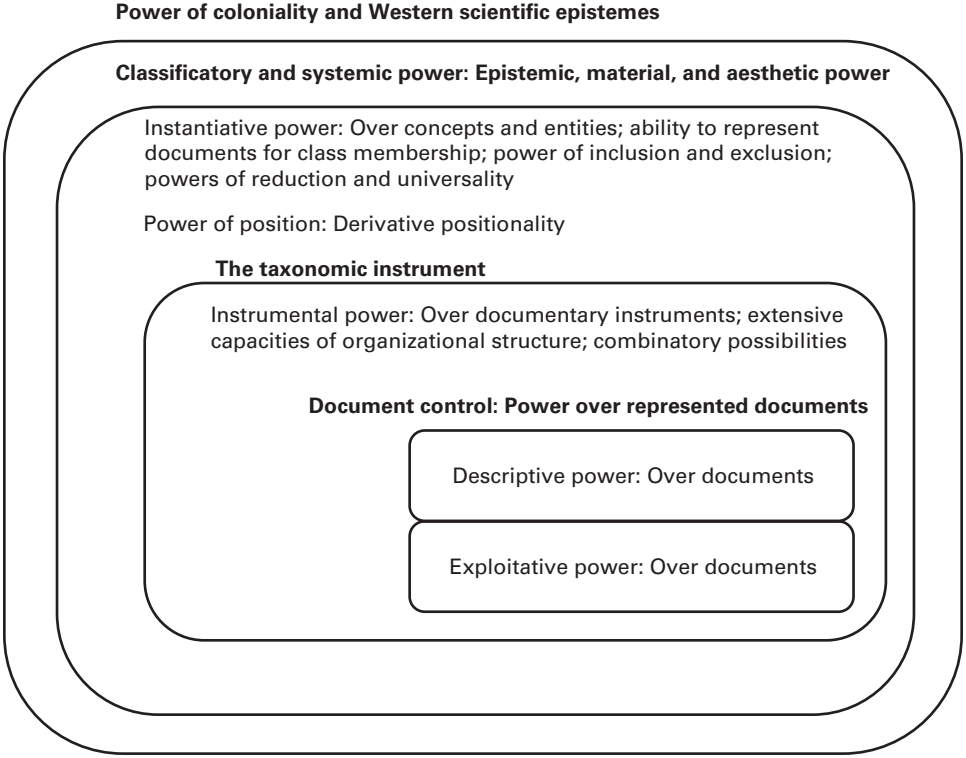


Figure 0.1
An analytic of classificatory power.

1. Power of coloniality and Western scientific epistemes
2. Classificatory and systemic power: epistemic, material, and aesthetic powers.
3. Taxonomic power (1): instantiative power: over concepts and entities; ability to represent documents for class membership; power of inclusion and exclusion; power of reduction and universality
4. Taxonomic power (2): Power of position and derivative positionality
5. Instrumental power: taxonomic instruments; internal and external extensive capacities.
6. Document control: descriptive and exploitative power as expressed by Patrick Wilson (1968).

Chapter 1 discusses the Catalogue of Life as the primary case of this text and shows how the "epistemic space" of these classifications are fraught with inconsistencies. In a composite environment, many different contributed taxonomies are juxtaposed in ways that defy traditional taxonomic norms. This creates vast gulfs in the practice of biodiversity between those that support such access-oriented measures and those that see these measures as obfuscating the function and practices related to traditional, internally consistent taxonomic systems.

In chapter 2, I begin by laying the theoretical groundwork for power within information studies as it relates to classificatory and representational spaces. A short narrative about the Australian dingo describes how classifications provide us the *power over* certain entities by virtue of classification, and the *power to* enact some kind of change—to the negative or the positive. I describe both the active and dispositional capacities of classifications. Active powers are those powers that are purposive, whereas dispositional powers are powers that are either unexpected or dormant until some user invokes them to some social end. I describe power as being both an individual power and a structural power that has an embedded, systemic quality that makes power difficult to identify in classifications. Classifications, as such, also make it seem as though the nature/human divide is real, but I argue that is not the case. I then describe how classifications have power over us in both material and epistemic ways. Classifications are epistemic

in that they help us position ourselves in relation to other entities in the world, and as such, they are integral in helping us shape our lived and imaginary identities. Such identities depend on our relative positions in systems, which I call a *derivative positionality*, invoking feminist and indigenous theories of positionality to do so. I define the boundaries of classification in terms of their epistemic and spatial attributes, variously using the work of Miranda Fricker, Michel Foucault, Jane Bennett, and, especially, Henri Lefebvre to make these assertions.

In chapter 3, I briefly introduce the practical aspects of global biodiversity control by emphasizing and describing the processes by which we aggregate local data into global spaces and how this has prompted many epistemic challenges in the biodiversity world, connecting these issues to the Catalogue of Life. I end by asserting that social-ecological system approaches to understanding classifications, as postulated by Elinor Ostrom (2009), might be one analytic by which we can better understand the materialization of power in systems and may provide an avenue by which we can deconstruct systems to this end. In chapter 4, I turn to the power of instantiation, which is a core notion within the classificatory domain. I briefly describe how taxon concepts are formulated in biodiversity work and connect this process to the notion of instantiation theory within information studies. I then lay out the operational mechanisms that the Catalogue of Life, and others, has created to maintain control of taxon concepts-as-nomenclature over time.

Chapter 5 takes the structural "epistemic space" of classifications as its main subject and outlines how we see classifications as being constructed by way of a series of ontological and epistemological commitments about the natural world—and knowledge, more generally conceived. I first describe how the concept of forming species taxa involves artificially carving out categories (taxon, species, and so on) from an organic, continuous whole. I invoke scholars such as Alfred Whitehead, Kriti Sharma, and John Drupré to make the case that process studies has something to add here, focused as it is on understanding a system-oriented notion of being. My attention then shifts to the internal space of biodiversity classifications and briefly outlines how one's methodological and theoretical approach to taxonomy

(by way of evolutionary taxonomy, cladism, and pheneticism, for example) produce fundamentally conflicting structures that are epistemically irreconcilable. I then end the chapter with a critique on *reduction* and *universality*, which are both necessarily core tenets of bibliographical, documentary, and biodiversity classifications.

Chapters 6 and 7 illustrate findings from my fieldwork with the Catalogue of Life and GBIF. Chapter 6 outlines the data-driven knowledge potentials of composite classification. By extending Wilson's two powers—descriptive power and exploitative power—I articulate *extensive power* as an integral attribute of these systems. Extensive powers work internally and externally. Internal extensive capabilities allow users to better understand the contours of the biodiversity data environment as it is expressed in the Catalogue of Life, or within any singular database space. With a global view of data, we can better understand where there are gaps in knowledge, as well as how we might bridge some of these gaps using data aggregation techniques. External extensive capacities include how the Catalogue is used in other systems and, by such a mechanism, influence the epistemic space far beyond its own boundaries. Finally, I discuss the power of prediction—with new aggregations of global data, one can use said data to make future-oriented inferences that would otherwise be impossible with siloed databases. Chapter 7 focuses on the contentions with composite systems, which are not minor or few. We see the impact of commingling different epistemic realities within one system. Problems arise with data control, with obfuscating local forms of knowledge, and with essential problems assessing the viability of data removed from its source. The chapter ends acknowledging the syntactic limitations of almost all traditional systems, including the Catalogue. Taxonomic methods based on genetic material, for example, do not always apply nomenclature to taxa, meaning that they are irreconcilable with the Catalogue's name-based formulation. This creates parallel, but incommunicative, streams of knowledge.

In the final chapter, I extend the conversation started in chapter 7 and move into the realm of the epistemic limitations of the Catalogue, and of all classifications that emerge out of a Western scientific tradition. I illustrate how the Western world has colonized indigenous knowledge

via mechanisms that were (and are still) intended to "broaden our knowledge horizons." The result, however, is not the translation or integration of knowledge, but rather the essential reformulation of knowledge that is tantamount to continuing colonial epistemic violence. The chapter posits pluriversality as a worthy goal for Information Studies, particularly in designing the epistemic spaces of classifications. Though pluriversality has been proposed as a solution in other literatures, I offer a possible analytic and method to imagine new systems based in the field of design studies. I explain a *transition design framework* that can help us break free of our Western classificatory, univocal traditions. I end the chapter on the notion that classification justice is necessarily environmental and ecological justice, and if humanity is to change our epistemic frameworks, it is essential that information specialists play a part in refabricating our notions of what it means to "classify" at all.

CONCLUSION

In the end, no biodiversity taxonomic platform can serve all needs for all constituents; the question becomes how global control can be balanced with the flexibility required to do biodiversity work at the local level. Such flexibility can then be used to imagine and facilitate systems based on new epistemic modes of organization, radical connectivity, and collective dependencies. One goal is to think about how the historical, disciplinary, and theoretical specificity of biodiversity classifications can inform our own work and theories in information studies. This book, I hope, begins to show how the theories of information studies are applicable in realms far beyond our typical systems of concern. I also hope that my expansion of the concept of power helps us better intervene into classification systems such that we can make them more just and viable for multiple epistemic constituencies. Such an approach can, I believe, help us appreciate how the unique worldviews of myriad micro-cultures add positively to the inexhaustible (and beautiful) representational possibilities our information systems have to offer.

This book is freely available in an open access edition thanks to TOME (Toward an Open Monograph Ecosystem)—a collaboration of the Association of American Universities, the Association of University Presses, and the Association of Research Libraries—and the generous support of Arcadia, a charitable fund of Lisbet Rausing and Peter Baldwin, and the UCLA Library. Learn more at the TOME website, available at: openmonographs.org.

The MIT Press would like to thank the anonymous peer reviewers who provided comments on drafts of this book. The generous work of academic experts is essential for establishing the authority and quality of our publications. We acknowledge with gratitude the contributions of these otherwise uncredited readers.

This book was set in Adobe Garamond Pro by Westchester Publishing Services.

Library of Congress Cataloging-in-Publication Data

Names: Montoya, Robert D., author.
Title: Power of position : classification and the biodiversity sciences / Robert D. Montoya.
Description: Cambridge, Massachusetts : The MIT Press, [2022] | Series: History and foundations of information science | Includes bibliographical references and index.
Identifiers: LCCN 2021033972 | ISBN 9780262045278 (paperback)
Subjects: LCSH: Biology—Classification. | Life sciences—Classification. | Cladistic analysis.
Classification: LCC QH83 .M68 2022 | DDC 570.1/2—dc23/eng/20211221
LC record available at https://lccn.loc.gov/2021033972