Dave Lawrence
MATX 603 History of Interdisciplinarity and Multimedia
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Foucault, Michel. 1970. *The Order of Things: An Archaeology of the Human Sciences.* A translation of *Les Mots et les choses* (1966). New York: Pantheon Books.

I began my college career as a junior in high school in 1978. The summer before I began my senior year, I took a chemistry class. I had little interest in chemistry at the time, but my goal was to become a biologist, and two years of chemistry—one year of inorganic chemistry, another of organic chemistry—were required. I spent the entire summer hearing nothing of the work of Michel Foucault.

My full-time studies began in 1979. I had what was we biologists called a rather "classical" training, heavily versed in the dying subdiscipline of taxonomy. Despite growing research interest in cell and molecular biology and in applying mathematical models to biological systems, my instructors felt it was important for working biologists to be able to identify the organisms they studied. I admit to finding power in the naming of individual species—not power in some magical sense, but in the sense that the ability to name species helped me reduce the vast diversity of life around me into a manageable and comprehensible dataset. In addition, as western society increasingly recognized the primacy of the individual, my professors and I were among a ever-shrinking percentage of biologists who recognized the primacy of individual

species. We knew from our observations and those of others that different species played different roles in any functioning ecosystem, and that in many cases even closely related species are no substitute for one another should one or more be driven to local or total extinction.

Throughout the rest of my undergraduate career, I learned about the taxonomy, anatomy, and physiology of vertebrates (my primary interest in the beginning), invertebrates, parasites, and vascular and non-vascular plants. Many of these courses included discussions of the history of taxonomy (the act of classification) and systematics (the science behind classification). Foucault was not among the scholars mentioned in any of those classes.

Sometime in my sophomore year I embraced geography—specifically biogeography, or the geography of life—as a research interest, and much of my professional and academic life since graduation has been devoted to that field and its biological corollary, ecology. In many graduate seminars we have addressed the evolution of those fields and examined where and how they fit within the pantheon of other academic disciplines. My academic career prior to my enrollment in the Media, Art, and Text program at Virginia Commonwealth University consists of stints at six universities. They have all been in programs that—with the exception of one (journalism at Columbia University)—focused on some aspect of biology or geography. I have amassed more than 300 semester hours of academic credit. But I, with the possible exception of one class (The Map in Social Context at George Mason University), have not had reason to run across the work of Michel Foucault.

My blissful ignorance of Foucault's work has finally ended. After reading his musings on the history of biology in *The Order of Things*, I think I can say I would not have felt one whit deprived—either personally or professionally—if my ignorance had continued.

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In the chapters, "The Limits of Representation," Foucault argues that in the late eighteenth century there occurred a major shift in the way humanity understood the world, that "things are no longer perceived, describes [sic], expressed, characterized, classified, and known in the same way…"[1] That period was most certainly revolutionary—it in large part takes its name from two political revolutions and one economic one that began about that time. That much I will not dispute.

His discussion of the change in biological thinking, however, elicits a rather annoyed, "Huh?"[2]

Foucault claims his analysis will show that

> …the general area of knowledge is no longer that of identities and differences, that of non-quantitative orders, that of a universal characterization, of a general taxinomia, of a non-measurable mathesis, but an area made up of organic structures, that is, of internal relations between elements whose totality performs a function; it will show that these organic structures are discontinuous, that they do not, therefore, form a table of unbroken simultaneities, but that certain of them are on the same level whereas others form series or linear sequences.[3]

One would hope his writing in French is not nearly so unintelligible as its English translations, but he seems to be saying that the classification of life shifted from a focus on structures that can be seen to a focus on functions that cannot; this shift in focus (as best as I can make out from this dreadful prose) in turn destroyed the ability to use individual organisms or individual structures as representative examples of all others in a group.

Foucault demonstrates that he understands the purpose of classification well enough, "to determine the 'character' that groups individuals and species into more general units, that distinguishes those units one from another, and that establishes them to fit together to form a

[1] Foucault, *The Order of Things*, 217
[2] That's my polite response.
[3] Foucault, *The Order of Things*, 217

table in which all individuals and all groups, known or unknown, will have their appropriate place."[4]

So far, so good, but it does not take him long to run off the rails. In fact, it only takes him three sentences to diverge from biological reality. He makes much of the fact that the old systematists (such as Carl Linnaeus, the founder of the modern biological classification system) focused on visible structures that were "homogenous" within a group and that were "fixed from the outset," whereas the revolutionary "methodists" (not the followers of John Wesley) saw those structures as the "gradual result of a progressive confrontation." What that confrontation is supposed to be is unclear. It cannot be Charles Darwin's "survival of the fittest,"[5] as one of the men Foucault presents as an exemplar of this revolution in knowledge, Georges Cuvier, was a staunch creationist wise enough to discard the literal truth of Genesis, yet still vigorously opposed to the evolutionary theories of Jean-Baptiste Lamarck and others in the decades before Darwin and Alfred Russel Wallace first presented their theories of evolution by natural selection in 1859.

Foucault argues that three biologists, Antoine Laurent de Jussieu, Lamarck, and Félix Vicq-d'Azyr, transformed systematics from a discipline based on the "described structure" into one based on the "classifying character."[6] He argues that the resulting principle, that of "organic structure" is "alien to the domain of the visible." He then posits four ways in which this "organic structure" appears[7]:

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[4] Foucault, *The Order of Things*, 226

[5] The phrase "survival of the fittest" was actually coined by Herbert Spencer in describing Darwin's principle of "natural selection" in the book *The Principles of Biology* (1864). Darwin began to use it in a later edition of *On The Origin of Species* in 1869.

[6] This concept seems somewhat ludicrous to me, as I am sure that Linnaeus would argue he used "classifying characters" in devising his system for the ordering of life. Every dichotomous key I have used (and I have used and still own quite a few) relies on such visible, described structures to help distinguish taxons (groups of organisms) from one another.

[7] This seems a confusion of terms in that the verb "appears" implies something that can be "seen" in a literal, or at least a figurative, sense.

1) as a hierarchy of characters in which some types of characters are more useful in classifying organisms than others;
2) as characters linked to functions, such as digestion, locomotion, and reproduction;
3) as a tool indispensible to the classification of organisms;
4) in the dissolution of the parallelism between classification and nomenclature.

The passage in which Foucault describes these four "appearances" of organic structure begins on solid ground. Biologists have long recognized that some characters are more important than others in distinguishing taxa (the plural form of taxon, or group of organisms). Foucault does not seem to have a good grasp of taxonomy, though, for in his examples he uses formal names (and now outdated ones) for four families of plants—Gramineae, Compositae, Cruciferae, and Leguminoseae—and common names for groups of animals: worms, fishes, birds, and quadrupeds. The families of plants are formal taxa (though better known today as Poaceae, Asteraceae, Brassicaceae, and Fabaceae, respectively), where as the groups of animals he cites are hodgepodges. The only unitary group are the birds (class Aves). Whereas "fishes" may seem clear to most laymen, there are actually several classes (same level or organization as Aves) of fish, such as the Chondrichthyes (cartilaginous fish) and Osteichthyes (bony fish). Several unrelated taxa could be called worms, such as the phylum Annelida (earthworms and polycheates), Platyhelminthes (flatworms), and several phyla collectively known as Aschelminthes (roundworms such as nematodes and rotifers). As for "quadrupeds," that just means a four-legged animal. This includes many mammals, many reptiles (lizards and dinosaurs), and amphibians (salamanders). If we accept that bats—members of the mammalian order chiroptera—are quadrupeds, then we must also accept the aforementioned birds, too, as

well as the extinct flying reptiles of the pterosaur group as quadrupeds, for the vertebrate wing is nothing but a modified forelimb.

My ranting aside, most taxonomists as far back as the pre-revolutionary Linnaeus recognized that not all characters are created equal when it comes to classifying organisms. Linnaeus focused on flower parts, for example, because they are more definitive than vegetative parts (leaves, stems, roots) in distinguishing species. I doubt d'Azyr was the first to figure out, for example, that mammalian teeth—which can vary quite a bit from taxon to taxon—were better taxonomic characters to use than the color of a mammal's fur, which can vary quite a bit from individual to individual.

Linnaeus may have considered the functional aspects of the structures he used in his classification schemes irrelevant to his work. But to argue that he did not connect structure to function stretches credulity. In his classifications of vascular plants, for example, Linnaeus focused on the structures of flowers—the reproductive (or naughty) bits. He, as well as most of humanity at the time, would have been aware of the fact of sexual reproduction (if not of all its mechanisms). Most people at the time were aware that offspring tended to resemble their parents. They did not need to wait for Darwin or Gregor Mendel to begin to take advantage of that knowledge to create breeds of animals and varieties of plants that served some human purpose. (Humans had been practicing selective breeding long before anyone even considered creating the British or Hapsburg empires into which Darwin and Mendel, respectively, were born, and long before the Vikings spread out from Linnaeus's native Sweden.)

Foucault claims that,

> …character is no longer drawn directly from the visible structure, and without any criterion other than its presence or absence; it is based upon the existence of

> functions essential to the living being, and upon relations of importance that are no longer merely a matter of description.[8]

This is a hard claim to accept. Even if function is taken into account when devising a biological classification, the classifications are based on characters that can be *described*. Indeed no species can be recognized unless it is formally described in the scientific literature following rules set down, for example, in the International Code of Botanical Nomenclature and the International Code of Zoological Nomenclature. These rules, while they may have evolved over the years, follow conventions that date back to Linnaeus, who adopted the system of binomial nomenclature[9] that all of the scholars cited by Foucault, and most scholars since, follow.

I find it hard to understand the significance of Foucault's proposition that:

> Character is not, then, established by a relation of the visible to itself; it is nothing in itself but the visible point of a complex and hierarchized organic structure in which function plays an essential governing and determining role. It is not because a character occurs frequently in the structures observed that it is important; it is because it is functionally important that it is often encountered.[10]

Generally, common characteristics occur frequently because they do have some useful function. That is not always the cause. Some characters are common in a group as result of some evolutionary accident—wisdom teeth in humans for example—even if they appear to be unnecessary today. Our ancestors had them, so we have them, too. (We now call such oddities vestigial characteristics.) Functional or otherwise, they may still offer clues as to the evolutionary relationships among taxa.

Foucault begins his discussion of the third way that "organic structure" appears with this astute observation, "Given these conditions, it is understandable how the notion of life could become

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[8] Foucault, *The Order of Things*, 227-228.
[9] In binomial nomenclature, a scientific name of a species consists of a genus (analogous to one's surname) followed by a specific epithet (analogous to one's given name). Thus, the scientific name for the redbud tree is *Cercis canadensis*.
[10] Foucault, *The Order of Things*, 228.

indispensable to the ordering of natural beings."[11] I am mystified as to why this would appear so novel to Foucault. The notion of life has always been indispensable to the ordering of natural beings—even in the book of Genesis, one gets the idea that had the organisms boarding the Ark would not rate much of a mention, nor be worth the passage, if they were not alive.

Foucault goes to great lengths to argue that the emphasis on function is a tremendous break from the emphasis on structure, but his argument wears thin. Consider his quote from Lamarck on the placement of crustaceans in the overall placement of invertebrates:

> Consideration of the articulations of the bodies and limbs of the crustaceans has led all naturalists to regard them as true insects, and I myself long followed the general opinion in this regard. But since it is recog-nized that organic structure is of all considerations the most essential as a guide in a methodical and natural distribution of animals, as well as in determining the true relations between them, it follows that the crustaceans, which breathe solely by means of gills in the same way as molluscs, and like them have a muscular heart, ought to be placed immediately after them, before the arachnids and the insects, which do not have a like organic structure[12].[12]

While Foucault argues the function, not the structure, is important, what are Lamarck's criteria for the placement of the crustaceans where he recommends? They breathe via gills. Gills are an identifiable, visible structure. It matters little to the person trying to identify the organism, who is looking at a dichotomous key, what the structure is for. That is not to say that knowledge of function is unimportant. It is, but structure is the key factor in helping identify the organism. Once one moves beyond the immediate problem of identification, structure and function are often so tightly intertwined that they cannot be separated in the manner Foucault attempts.

Foucault also seems obsessed with differentiating between what can be seen with the naked eye and what requires other imaging equipment, such as a dissecting microscope, to view. The biological relevance of such a distinction is nil—unless one is choosing a graduate program.

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[11] Foucault, The Order of Things, 228.
[12] Lamarck, Jean-Baptiste. 1801. *Systeme des animaux sans vertebres*, as quoted in Foucault. *The Order of Things*, 229.

Robert Hooke described the cell—the basic unit of life—in the seventeenth century. Antonie van Leeuwenhoek first described bacteria, protists (a mishmash of mostly single-celled plants and animals), and specific plant and animal cell types. Both men were dead before Linnaeus began his scientific career. Even with macroscopic plants, Linnaeus had to have spent his share of time looking through a microscope as he studied the reproductive and other structures that he thought might help characterize the plants and animals he classified.

For much of this chapter, Foucault seems to confuse classifying with understanding. (Maybe I am confused by his writing.) For most biologists, classifying is not the end of understanding, rather it is but a beginning, as in I have identified the organism, but I still do not know where it lives or why it lives there—these questions are what inspired me to take up biogeography. As he closes this passage, Foucault does manage to latch on to something approaching a modern biologist's view:

> Henceforth, character resumes its former role as a visible sign directing us towards a buried depth; but what it indicates is not a secret text, a muffled word, or a resemblance too precious to be revealed; it is the coherent totality of an organic structure that weaves back into the unique fabric of its sovereignty both the visible and the invisible.[13]

Here he seems to be saying that the "character" can reveal deeper truths about the organism. If I interpret this correctly, I have found a rare point of agreement between Foucault and me. Unfortunately, that agreement evaporates in the next section.

> The parallelism between classification and nomenclature is thus, by this very fact, dissolved. As long as classification consisted of a pattern of progressively smaller areas fitted into a visible space, it was quite conceivable that the delimitation and denomination of the resultant groups could be accomplished simultaneously. The problem of the name and the problem of the genus were isomorphic. But now that character can classify only by means of prior reference to the organic structure of individuals, 'distinction' can no longer be achieved in accordance with the same criteria, or by means of the same operations, as 'denomination'. In order to discover the fundamental groups into which natural beings can be divided, it has

[13] Foucault, *The Order of Things*, 229.

> become necessary to explore in depth the space that lies between their superficial organs and their most concealed ones, and be-tween these latter and the broad functions that they perform. Any good nomenclature, on the other hand, will continue to be deployed in the horizontal dimension of the table: starting from the visible characters of the individual, one must find one's way to that precise square in which is to be found the name of its genus and its species.[14]

Foucault seems to be arguing here that a good classification scheme should be able to work without reference to the underlying biology of the organism being identified. He seems to desire a process whereby structure leads directly to name, without any reference to or consideration of any underlying function of the structure in question. Linnaeus may have been interested in nothing but identification, but most biologists since—including many of those cited in this chapter—were interested in some kind of deeper understanding of the organism. The identification is merely a tool to achieve an end, not the end itself. The end is usually a greater understanding of that organism's natural history: Foucault prematurely proclaimed natural history obsolescent. It is still relevant today, whether under its former name, or some new one such as ecology or biogeography.

Likewise, Foucault ridiculously limits the scope of botany. He says that Lamarck claimed that:

> The two tasks of botany as two radically distinct entities: 'determination', which applies the rules of analysis and makes it possible to discover the name of an individual by the simple use of a binary method (either such and such a character is present in the individual being examined, in which case one must look for its location in the right-hand part of the table; or it is not present, in which case one must look in the left-hand part; and so on until the name has finally been determined); and the discovery of the real relations of resemblance, which presupposes an examination of the entire organic structure of species[14].[15]

Whether Lamarck should be the butt of the joke or Foucault, I cannot say, but most botanists I know, even the dinosaurs who still find taxonomy and systematic worthwhile, would laugh loudly and derisively at any university administrator who tried to limit their investigations to just

[14] Foucault, The Order of Things, 229-230.
[15] Lamarck. 1778. *La Flore francaise*, as quoted in Foucault. *The Order of Things*, 230.

those two tasks. At the time Lamarck would have written this, much of the work of botanists was focused on those tasks—but the limitations were not imposed by some ideological restriction, but by the nature of what they were doing. Europeans were spanning the globe, exploring much of several new worlds. There was so much material in terms of plant and animal specimens coming in that they were overwhelmed with the task of collection, identification, and ultimately classification. Before long, though, a new generation of natural scientists, such as Alexander von Humboldt, Darwin, and Wallace, saw the act of classification as nothing but a preliminary step in observing and understanding the patterns that make up our natural world.