

UC Berkeley

UC Berkeley Electronic Theses and Dissertations

Title

A Sense of the Real: Experimental Writing and the Sciences, 1879-1946

Permalink

<https://escholarship.org/uc/item/16t8422v>

Author

Cecire, Natalia Aki

Publication Date

2010

Peer reviewed|Thesis/dissertation

A Sense of the Real:

Experimental Writing and the Sciences, 1879-1946

by

Natalia Aki Cecire

A dissertation submitted in partial satisfaction of the
requirements for the degree of Doctor of Philosophy

in

English

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor C. D. Blanton, chair

Professor Lyn Hejinian

Professor Mark Goble

Professor Suzanne Guerlac

Fall 2010

A Sense of the Real:

Experimental Writing and the Sciences, 1879-1946

© 2010

by Natalia Aki Cecire

Abstract

A Sense of the Real:

Experimental Writing and the Sciences, 1879-1946

by

Natalia Aki Cecire

Doctor of Philosophy in English

University of California, Berkeley

Professor C. D. Blanton, Chair

This American literature dissertation offers an account of the critical category of “experimental literature,” arguing that, nebulous as the term appears to be, it is rooted in ideas of scientific experiment that were under debate in the late nineteenth and early twentieth centuries. While experimental literature is often described in terms of “formal innovation,” this dissertation reads literary form not as an autonomous category in its own right but as an indicator of epistemological investments. Borrowing Lorraine Daston and Peter Galison’s concept of the “epistemic virtue,” this dissertation argues that experimental literature seeks to produce a “sense of the real,” not by thematically treating scientific ideas or even by emulating scientific methods, but rather by using literary form to negotiate the changing landscape of what constituted scientificity in the first place. Epistemic virtues are the investments, at once methodological and ethical, that define the experimental mode. Experimental authors, this dissertation argues, seek ways for literature to produce knowledge with strong epistemic guarantees. The dissertation begins by reading Émile Zola’s *Nana* as an early articulation of how literature might engage in research. *Nana* reveals the centrality of the epistemic virtue of objectivity to Zola’s project, as well as a surprising symbiosis between objectivity and spectacle. A chapter on Gertrude Stein’s undergraduate and graduate scientific research and early writings (through *Three Lives*) shows that a naturalist version of experimentalism feeds directly into Stein’s modernism. A chapter on the poetry of Marianne Moore argues that precision is the key epistemic virtue that Moore deploys, and that precision’s refusal of hierarchy and negotiation of “high” and “low” cultural forms has underwritten the ambivalent reception history of her work. The final chapter reads William Carlos Williams’s late poem *Paterson* together with Boasian anthropology to argue that Williams’s late poetic image operates as a means of guaranteeing presence.

Table of Contents

List of Figures.....	ii
Acknowledgements	iii
Chapter One. Introduction: Experimental	1
Chapter Two. A Long and Frightful Kitchen: Naturalism and the Pleasures of Science.....	15
Chapter Three. Seeing Clear: The Objectivity of “Melanctha”	60
Chapter Four. Marianne Moore’s Precision	106
Chapter Five. Near and Far in <i>Paterson</i>	141
Bibliography	170

List of Figures

Figure 1. “La Femme sans nom,” from <i>Les Français peints par eux-mêmes</i> (1840).....	72
Figure 2. From Florence Sabin, <i>An Atlas of the Medulla and Midbrain</i>	84
Figure 3. Gertrude Stein to Dr. Lewellys Barker (n.d., but evidently 1902).....	87
Figure 4. An example of Frege’s notation.	91
Figure 5. The turnstile, signifying assertion.	91
Figure 6. From William Earl Dodge Scott, <i>Bird Studies</i>	123
Figure 7. Robert Ridgway, Plate VI, from Baird, Brewer, and Ridgway, <i>A History of North American Birds</i>	124
Figure 8. Robert Ridgway, “ <i>Poocætes gramineus</i> [Grass Sparrow; Bay-Winged Bunting],” from Baird, Brewer, and Ridgway, <i>A History of North American Birds</i> (545).	125
Figure 9. The AMNH’s Ostrich and Warthog Group, 1940.....	130
Figure 10. A “cyclorama group” pictured in Lucas’s “The Story of Museum Groups”	133
Figure 11. Fig. 1. The <i>Geographic</i> picture: the wives of a Mangbetu chief.	154
Figure 12. The iconic picture of Nobosodrou, from the book <i>La Croisière Noire</i>	155
Figure 13. Advertisement for the Exposition Coloniale, 1931.....	156
Figure 14. An ash-tray commemorating the <i>Croisière Noire</i>	157
Figure 15. Citroën hood ornament commemorating the <i>Croisière Noire</i>	157

Acknowledgements

In the process of writing this dissertation, I have taught a number of students under the auspices of the English Department, and in teaching them about writing, I have been led to reflect on my own writing processes in ways that, I am convinced, would have been impossible without the experience of teaching. Though it is a cliché to mention the ways in which the teacher is taught, I owe my formation as a teacher to those students, and through it, a crucial component of my formation as a scholar. Dorothy Hale and Kent Puckett were admirable teaching mentors when I assisted in their courses, and have since remained mentors, interlocutors, and providers of wonderful practical counsel. Bob Hass and Brenda Hillman changed my relationship to contemporary poetry, and therefore to modernist poetry. Several fellow graduate students gave me valuable feedback on individual chapters, especially Julia Bloch, Juliana Chow, Charles Légère, Annie McClanahan, and Katie Simon. I am also grateful to Elizabeth Abel, Moon Duchin, Ian Duncan, Eric Falci, David Landreth, Celeste Langan, Kate Lingley, Namwali Serpell, and Katie Snyder for insightful comments on individual components of the dissertation. Colleen Lye has been a mentor and a model throughout my graduate career; her support, encouragement, and incisive questions have been invaluable to this project and to me. Suzanne Guerlac first taught me to interrogate the relationship between the literary and the visual. I am grateful for Mark Goble's intellectual and personal generosity; his methods have shaped mine. My sense of the arc of American poetics has been crucially influenced by Lyn Hejinian, whose open-mindedness, passionate engagement, and intellectual capaciousness remain models to which I aspire. Dan Blanton has helped me in innumerable ways, from lightning-quick, insightful feedback to practical advice and Prufrock jokes. His scholarship and his mentorship have been crucial to my work. Hillary Gravendyk has been a true friend and a true colleague; this dissertation would have been impossible to write without her companionship and intellectual engagement, for which I am deeply grateful.

Chapter One

Introduction: Experimental

There are numerous versions of these qualms about the efficacy of experimental thought, except in the sciences, where it's seen as the nature of the enterprise. My inclination is to respond by identifying a certain poetics of responsibility with the courage of the swerve, the project of the wager—what I call a poethical attitude.

—Joan Retallack, *The Poethical Wager*¹

This is a dissertation about American experimental writing. The wariness, confusion, and even aggression with which I have been asked, *What do you mean by that?*, speak to the deep feelings with which we as literary critics have invested literary experiment, and to the continued intellectual centrality of the idea that literature *can* be experimental—even as we are forced to acknowledge that we do not quite know what the word means. So, of course, *What do you mean by that?* is exactly the question. We have made this term, “experimental,” alternately very capacious and very literal, alternately broad and narrow. In our broader usage, “experimental” means any writing that is in some way “interesting,” especially formally. Its synonyms, in such usage, are “innovative” and (sometimes) “inventive,” the terms of industrialized technoscience. In this capacious variant, “experimental” is a term of approval; it means writing that is, in some basic if ill-defined sense, *good*. The counterpart to this capaciousness is a highly literal understanding of “experimental” as modeling the procedures of a scientific experiment, generally understood to be undertaken by a writer somewhere in space and time, the results (the data) of which appear on the page. While the narrower model has the virtue of actually making it possible to exclude some literature from the category of “experimental,” such literalism, it will swiftly be noted, is only enabled by a radically impoverished and ahistorical caricature of what constitutes a scientific experiment.

Although, as it must be clear, I find neither of the above definitions satisfactory, I do believe that something meaningful is captured in the category of the “experimental” as it is currently employed, and the two above-mentioned models offer us insight into how we might refine it. First of all, we root the “experimental” in the models of experimental science, which frequently are but need not be construed in simplistic or ahistorical terms. And second, it is a term of approval, something that marks the seriousness and intellectual—and usually also moral—value of the work, which again need not be regarded uncritically. Even the contradictory bifurcation of the term “experimental” grants us insight into the kind of work the term does for us. The desire to make “experimental”

capacious, on one hand, and rigorous, on the other, registers a tension that has already been the subject of debate in the sciences for centuries, as scientists and historians and philosophers of science have struggled to define just what makes a procedure or an idea scientific. The science historian Steven Shapin, writing about the early modern period, has pithily pointed out just this tension, writing that “[f]aith in Method grew even as incompatible versions of what such a Method might be proliferated” (*Scientific Life* 32). The need for both capaciousness and rigor thus characterizes not only our understanding of experimental literature, but also of experimental science—indeed of *science*—as a concept, and the problems that arise from it will reappear continually in this dissertation, both for me and for the authors and scientists whose work I examine.

Having sketched out the basic associations that underpin our current usage of the term in American letters, I wish to outline more specifically what it is that I mean by “experimental”:

1. Experimental writing is not a formal category but an epistemic category, defined by a concern with producing knowledge.
2. Experimental writing is historical; it originates in the late nineteenth century and has continued, in various guises, up to the present moment.
3. Experimental writing is defined by a strong relation to the sciences, without, however, being science; experimental writers coexist with scientists and scientific institutions of greater and lesser professionalism within a constantly changing epistemic field.
4. Experimental writing is defined by epistemic virtues, ethics of knowledge-production, which account for its claims to be an ethical kind of writing.

1. Experimental writing is not a formal category but an epistemic category, defined by a concern with producing knowledge.

Experimental writing is usually described in terms of form; indeed, “formally innovative” is a term often proposed as a synonym for “experimental.” This is a phenomenon that I wish both to interrogate and to account for. As a definition, “formal innovation” has all the virtues and problems of the first commonplace definition of “experimental writing” that we explored; while usefully capacious, the term serves better to signify approval than to delimit a category. While it may be tempting to read particular literary forms as procedures that constitute a repeatable experimental method, I would argue that literary experiment instead relies on the possibility of making method responsive to the material and conceptual particularities of the thing(s) being studied, a possibility made radically visible in the social and biological sciences. The analogy between “formal innovation” and scientific experiment proposes a Whig literary history that depends on a Whig history of science, construing science as a series of advances toward an enlightened

present.² Although there are legitimate arguments to be made for a progressive model of the sciences,³ the analogy proposed by the model of “formal innovation” is as inadequate to the history of science as it is to literary history, and moreover, the claim to formal innovation almost never holds up to scrutiny on historical grounds. I would suggest that, generally, the supposed autonomy of form (as a thing that can be “innovated”) implied in this casual use is very much undercut by the logic of the very experimental mode that form supposedly defines. Experimental writing as it is practiced does not invent forms for their own sake, but rather in the service of epistemic goals that are only intelligible in historical terms. No particular formal “innovation”—for instance, a rejection of accentual-syllabic meters—stands on its own, independent of its literary-historical environment; thus Walt Whitman’s use of long free-verse lines cannot be understood as an “invention” to be picked up and applied by later authors like William Carlos Williams.⁴ While it is, I think, true that most experimental writing is formally “interesting” (not to say “innovative”), the effects of those formal properties vary considerably according to the contingencies that surround them.

Since brief reflection reveals that there is no specific form or set of forms that can, in the end, serve as a clear indicator of literary experimentalism, it is more productive to read the forms of experimental literature not as primary indicators but as a consequence of some other factor that defines experimentalism—specifically, the common cause that experimental writing makes with experimental science. This “common cause” warrants some explanation, for there has been an abundance of highly productive studies linking literature with the sciences in recent decades, and few if any of them have relied on the approach that I take here.⁵ Like the sciences, experimental literature is oriented toward the production of knowledge; it takes for granted that human beings can and should produce knowledge, and that they can only succeed in doing so by engaging in procedures and rituals that regulate how knowledge is gathered, ratified, and disseminated. The epistemological orientation of experimental literature perhaps helps to explain why it is so often evaluated in terms of its “interest” rather than, say, its beauty.⁶ The experimentalism that I read in Zola, Stein, Moore, and Williams is therefore not formal, though it may be (and generally is) manifested formally, but rather conceptual. While this quite often comes down to analyzing literary form, it is not form itself that defines experimentalism, but rather the practices and attitudes that subtend those forms. Thus, while I read Marianne Moore’s endnotes as indices pointing outward to constructed species-like categories, it is not the fact of having endnotes but the category-making ends to which those endnotes are directed that help to define Moore’s precision. I therefore wish to insist on the capaciousness of the idea of being “experimental” by attending to those qualities that make it possible for psychologists, epidemiologists, naturalists, anthropologists, etc., to be “experimental” in the course of studying objects that by their very nature do not admit of certain kinds of experiment, for ethical or practical reasons—just as literature does not lend itself to titration or gel electrophoresis.⁷ Claude Bernard, the nineteenth-century French physiologist, termed this quality “experimental reason,” the capacity to *think* experimentally about something that is not in a strict sense an experiment—for instance, in observing the

effects of a severed nerve, when the nerve has been severed not by a scientist but in a hunting accident. Bernard's "experimental reason" is one example of a scientist finding a way to be *experimental* in the absence of what might canonically be recognized as an *experiment*, something that scientists and (as this dissertation argues) authors continually attempted in late nineteenth and early twentieth centuries.

2-3. Experimental writing is historical; it originates in the late nineteenth century and has continued, in various guises, up to the present moment. Experimental writing is defined by a strong relation to the sciences, without, however, being science; experimental writers coexist with scientists and scientific institutions of greater and lesser professionalism within a constantly changing epistemic field.

Literary history abounds with instances of authors whose engagements with the sciences were significant, and if a deep and sincere engagement with the sciences were the only relevant criterion, there might be no periodizing experimental literature. This stops being problematic, however, as soon as we relinquish the idea that experimental literature is a free-floating, ahistorical form and recognize instead that the very concepts of "science" and "experiment" are not invariant across time and space. To be "scientific" in 1700 is not to be "scientific" in 1800 or in 1900. To identify an experimentalism in literature by its relation to the sciences, then, is already to have made a choice as to what scientific experiment is, a choice necessarily determined by period, field, and location. My aim here, moreover, is not to build a category called "experimental writing" from the ground up, but rather to account for and historicize the features of a literature already identifiable, however vaguely, as experimental—an essentially twentieth-century phenomenon. Thus, for example, the work of the eighteenth-century writer Maria Edgeworth, however substantively engaged with the sciences, is outside the scope of this project; "experimental" it might be, in the sense of modeling empirical methods of Edgeworth's period, but not in the sense that it bears any family resemblance, formally or epistemically, to the kind of twentieth-century writing that goes by the name "experimental." This project thus takes for granted the historicity and unevenness of scientific inquiry and identifies particular methodological tensions of the late nineteenth and early twentieth centuries as central to the development of experimental writing.

The later nineteenth century is marked by a number of phenomena conducive to the development of an experimental literature—a literature, that is, that undertakes to produce knowledge in a manner in keeping with scientific methods. Scholars of (British) Victorian literature have come to speak routinely of the "one culture" of the nineteenth century, a play on C. P. Snow's 1959 lamentation that the sciences had split away from arts and letters to form "two cultures." The "one culture" thesis, contra Snow, understands the sciences and arts as components of a single culture, not in order to collapse the categories of science and art but to understand both as participating in a wider field of ideas, positing, in George Levine's words, that "science and literature are two alternative but related expressions of a culture's values, assumptions, and intellectual frameworks" (vii).⁸

The “one culture” premise is less of an orthodoxy in the field of American literature, but it is particularly apt for a project such as mine that undertakes to explain the means by which writers came to see scientific methods and aims as “fair game” in the creation of literature. It is important not to caricature the “one culture” premise; it is not that science and literature can all be reduced to an undifferentiated soup of discourse, but that both literature and science in the late nineteenth and early twentieth centuries are highly dynamic social formations that never exist in isolation. This is, indeed, a fundamental assumption of the history of science of the last several decades, and has been applied to all historical periods in which scholars have identified anything going by the name of “science.” What interests me about the late nineteenth century in particular, however, is an identifiable and widespread sense that anything could, and probably should, be rendered scientific, whether manufacturing, housekeeping, public health, or literature. Two features of the later nineteenth century particularly dispose its scientific materials to co-optation by literary writers: popularization and diversification. While popularization had always existed to some degree, the nineteenth century is the great age of popular science, manifesting in an enormous array of demonstrations, world fairs, museums, public lectures, circuses, pamphlets, books, and magazines—what Bill Brown has called the “amusement/knowledge system” (*Material Unconscious* 208). Popularization drew public interest to the sciences and generally made science everyone’s business.

But more important still, I would argue, is the growth, institutionalization, and popularization of a specific set of sciences—precisely those sciences whose experimental status is often either in question or outright denied. These are the so-called “softer” sciences, the biological and social sciences.⁹ It is precisely the precarious canonicity of those sciences that, this dissertation argues, opens up the domain of the experimental for literature.¹⁰ The stakes of what constitutes a scientific method are particularly high for a science in the making, and by the end of the nineteenth century, the biological and social sciences were in many cases just professionalizing in American and European institutions. These sciences were highly self-conscious and at pains to establish their legitimate scientificity, often by developing methods that were as close to experimental as possible. As Ernst Mayr has observed, “the experiment is often referred to as *the* method of science,” owing to the priority usually assigned to the physical sciences in philosophies of science (30). While the social and biological sciences necessarily adapted methods to suit their objects of study, the epistemological authority of the experimental physical sciences was never far from view, as Claude Bernard demonstrates in his *Introduction à l’étude de la médecine expérimentale* (1865). Repeatedly pointing up antecedents in the physical sciences, Bernard proposes an experimental medicine that at once modestly announces its conformity to existing experimental physical science methods and boldly rewrites the concept of experiment to suit the study of the living body.¹¹ Similar gestures were necessarily made in other disciplines as well, as naturalists, anatomists, psychologists, and anthropologists sought to overhaul the epistemic underpinnings of the knowledge they were producing. The challenge for these disciplines was to maintain continuity with the canonical center of scientific consensus while extending a scientific orientation to objects

of study previously understood as the natural domain of theology, philosophy, art, and letters. In many cases, for instance in natural history and anthropology, this was accomplished by instituting and managing a distinction between popular and professional practices of the science, a distinction that was often in practice only incipient. It is at that interface between popular and professional, canonical and new that the most intense methodological questions arose and became available to an author interested in creating a sense of the real.

4. *Experimental writing is defined by epistemic virtues, ethics of knowledge-production, which account for its claims to be an ethical kind of writing.*

While, as I have argued, our heuristic notions of the experimental indicate the sciences as a reference point, I do not wish to sweep under the rug the slightly more embarrassing element of our usage that I brought up a moment ago: the use of the word “experiment” as a term of approval. For there is a sense in which experimental poetry is widely thought to be *good*—sometimes aesthetically, almost always ethically, and often both. In my epigraph above, one of our most respected contemporary poet-critics, Joan Retallack, makes the connection explicit; “experimental thought” is inherent in the sciences, Retallack writes, and it is simultaneously evidence of “responsibility” and “courage,” a “poethical attitude” (3). If anything, ethics, for Retallack, *takes precedence* over either aesthetic or epistemological concerns in experimental writing—hence the title of her book, *The Poethical Wager*.¹² As this dissertation repeatedly argues, and as Retallack’s invocation of the sciences suggests, this feature of experimental writing is not at odds with its commitment to (scientifically) experimental modes of establishing knowledge; rather, such ethical values are imported from our existing notions of scientific experiment. The courageous swerve is, in Retallack’s words, “seen as part of the nature of the enterprise” of science. This is due, this dissertation argues, to the epistemic authority claimed by and generally granted to the sciences; in Roy Wallis’s words, “[s]ince its emergence as an identifiable social enterprise, science has laid claim to a distinctive relationship to knowledge, worthy of particular respect” (585-6).

My aim here is not to endorse (nor to repudiate) the ethical values of experimental writing, but it is crucial that we examine them, for the ethical goodness of literary experiment is central to our understanding of what literary experiment is and does. When writers and critics invest experimental writing with ethical values, they are not illegitimately projecting onto the sciences; rather, the ethical dimension of experimental writing registers the centrality of ethical concerns in the very concept of being scientific. Such concerns are borne out in the practices as well as in the theories of scientific research, as Lorraine Daston and Peter Galison have powerfully shown. In their study *Objectivity*, Daston and Galison argue that ideas of scientific *selfhood* lie at the heart of the idea of scientific rigor, a selfhood that is of course historical (39). “The mastery of scientific practices,” they observe, “is inevitably linked to self-mastery, the assiduous cultivation of a certain kind of self” (40). This means that *doing science well* is not only a matter of technical proficiency but also of

self-discipline, and of having the right attitude toward the work at hand. The scientist, in other words, must have what Daston and Galison call “epistemic virtues,” “norms that are internalized and enforced by appeal to ethical values, as well as to pragmatic efficacy in securing knowledge” (40-1).

Epistemic virtues are at once ethical values (i.e. belonging to an ethos) and epistemic ones (i.e. relating to the apprehension of knowledge). Objectivity, for instance, is an epistemic virtue, because it is both a means of securing knowledge and an ethical obligation. Because they help to define the nebulous yet highly charged concept of scientificity, epistemic virtues are usually casually thought to be logically consistent with one another: the scientist is thought to be objective *and* precise *and* truthful, with no contradictions implied. But this need not be the case, as Daston and Galison observe; for example, “[s]cientific practices judged laudable by the measure of truth-to-nature—such as pruning experimental data to eliminate outliers and other dubious values—may strike proponents of objectivity as dishonest” (*Objectivity* 41). Moreover, different epistemic virtues may historically overlap, intersect, and affect one another; different scientists and different subdisciplines may hold different values in the same historical moment. In addition to explaining the epistemological-ethical complexity of experimental literature, the concept of the epistemic virtue allows us to distinguish between our own ethical values and the ethical values implicit in experimental literature. By recognizing epistemic virtues as such, we are relieved of having to identify the scientific with the good, the pure, the autonomous, or the true; we are able to accept the scientificity of procedures and ideas that we now believe to be flawed, contaminated, or false—as we must, if we are to avoid begging the historical question.¹³

This argument proceeds in four chapters that address three epistemic virtues. The first two chapters, on works by Émile Zola and Gertrude Stein, form something of a unit, perhaps counterintuitively; although Stein is in many ways the quintessential experimental modernist, while Zola’s experimentalism is rarely understood as anything but an antecedent to what we now think of as experimental literature, the two opening chapters call attention to the many thematic, epistemic, and even stylistic connections between them. Chapter Two, “A Long and Frightful Kitchen: Naturalism and the Pleasures of Science,” examines Zola’s 1879 essay “Le Roman expérimental” [“The Experimental Novel”] and his novel *Nana*, serialized in the same year. My choice of Zola to begin the dissertation is tendentious in one way, utterly conventional in another. Zola’s essay is the first and most influential statement of a literary commitment to experiment conceived in specifically scientific terms, and in that sense an obvious place to begin a dissertation on experimental writing.¹⁴ Indeed, in *The Language of Inquiry*, Lyn Hejinian points to just this essay as an early articulation of the kind of experimental impulse that Gertrude Stein would later take up (88-9). This is, however, an idiosyncratic literary history, in that the writing usually now termed “experimental” is usually characterized by a formal difficulty that Zola explicitly rejected, a point that Hejinian characterizes as a terminal failing of the naturalist project. I argue, however, that the connection between Zola’s “experimental

novel” (that is, the naturalist novel) and what we currently understand as experimental writing rests on far more than the word “experimental.”

The notion that naturalism has no particular style is not only critical conventional wisdom but also a claim embraced by the naturalists themselves (Hejinian quotes Paul Alexis, for instance). Zola’s own preface to *Le Roman expérimental* (the 1880 collection containing the essay of the same name) makes much of what Zola represents as an absence of style, guaranteed by the fact that the collected essays were originally destined for translation into Russian.¹⁵ Having no particular style, Zola intimates, amounts to eschewing flourish in favor of truth. That such a self-conscious rejection of stylized form constitutes a style goes without saying, but more importantly, it is a style conceived as *good for producing knowledge*. As this dissertation elaborates, although the writings of Zola, Stein, Moore, and Williams are all formally very dissimilar, each is fashioned in its own way as bearing a style that is good for producing knowledge, by way of the epistemic virtues of objectivity, precision, or presence.

In “A Long and Frightful Kitchen,” I argue that the writings of 1879-80 (the novel *Nana* and the essays collected in *Le Roman expérimental*, including “Le Roman expérimental” and “Du Roman”) all meditate on the production of knowledge, polemically in the essays, and through the always questing figure of the Comte Muffat de Beuville in *Nana*. Zola sets two competing models of experiment against one another; the first, a linear, static proceduralism, imagines the production of knowledge to be as mechanical as the turning of a crank; the second, characterized by what Claude Bernard calls “*tâtonnement*” (fumbling about), visits knowledge on the knower through the misfires and accidents of an awesome and spectacular reality (to borrow Vanessa Schwartz’s phrase) that impinges upon the knower. Zola’s rhetorical management of these two modes—one the triumphal, scientific model of popular science, one the “long and frightful kitchen” (in Bernard’s words) of a science whose methods are still radically subject to adaptation—secures scientific authority, on one hand, and specular pleasure, often through actual spectacles like the panorama and phantasmagoria, on the other.

The chapter makes no attempt to situate Zola’s naturalism in a wider French literary history; its purpose, rather, is to set up the terms of literary experiment that will become important in the American context of the rest of the dissertation. In self-consciously adapting Bernard’s writings on experimental medicine, Zola brings into relief the dynamism of the biological and social sciences in this period and the ways in which that dynamism opened up further possibilities of adaptation. Zola’s experimental writing is rendered experimental not by the wholesale adoption of some existing method (which would be impossible) but by the adoption of an experimental *orientation* defined by the performance of objectivity. Indeed, Zola performs that objectivity through his claims to stylelessness, which announce an authorial non-self-presence likewise modeled by Muffat’s ultimate surrender to perception.¹⁶ While laying the groundwork for the later chapters’ explorations of epistemic virtues in fairly straightforward ways, beginning an account of experimental writing with Zola also allows naturalism’s non-obvious continuities with experimental modernist writing to emerge. Apart from the project of knowledge-

production that is the focus of this dissertation, the elements that they hold in common include the myriad flirtations with the idea of writing without style (literalized, in Gertrude Stein's case, in B. F. Skinner's charge that her writing was a symptom of hysterical automatism); a deep interest in the role of visuality in producing and guaranteeing knowledge; a simultaneous anxiety and sense of euphoria surrounding the possibility of studying living beings, and especially human beings, scientifically; and an abiding concern with the scientific dynamics of race and gender. These are all concerns that are central to experimental writing in part because they are central to the development of the biological and social sciences in the late nineteenth and early twentieth centuries.¹⁷

Zola's style, despite being disavowed as a non-style, is distinguished by elements such as the assembly of stylized visual tableaux (for instance, that of Nana posing as Mélusine on the stage); formal symmetry (e.g. the symmetry between Sabine and Nana and their respective dinner parties); exhaustive description; and word- and phrase-level repetition. It is striking to note the ways in which Gertrude Stein's 1909 "Melanctha" repeats and even intensifies the same formal strategies. Chapter Three, "Seeing Clear: The Objectivity of 'Melanctha,'" follows on the preceding chapter's exploration of objectivity as an epistemic virtue to interrogate what it would mean to make the seeker of objective knowledge—presumed masculine by Zola—into a woman. I trace this question from Stein's early scientific work as an undergraduate through her research at the Johns Hopkins Medical School and finally to *Three Lives*. The gendering of scientific objectivity has been the subject of much debate in feminist history and philosophy of science, and I argue that the "invisibility" of early twentieth-century female scientific labor helps us to understand the way in which female objectivity manifests in Stein's work. In "Melanctha," Stein intensifies the naturalist formal strategies of symmetry, description, and repetition to push this abstraction far beyond the boundaries of intelligibility within the discipline of neuroanatomy, into the territory of what Daston and Galison call "structural objectivity." This extreme version of objectivity, defined by the refusal of heuristics and individual perception, replaces the Zolian visual spectacle, so often a stylized tableau, with a visuality that is not visual at all, but rather always subsumed by the categories of race and gender. The formal strategies through which this objectivity is produced at once constitute the story's naturalism and its experimentalism. The formal features often remarked to be Stein's experimental "innovation" are also the features that make it possible to read "Melanctha" as a naturalist text, a closed linguistic ecosystem spiraling through repetition toward a fatal dénouement.

The next chapter, "Marianne Moore's Precision," pushes further on the role of gender in science by exploring Moore's use of the epistemic virtue of precision. Precision, like objectivity, guarantees a specific kind of accountability to an external reality—no longer knowledge's independence from the knower, as with objectivity, but rather its high-resolution adherence to external structures. Moore's example shows that female precision, like female objectivity, is both epistemically authoritative and threatening. Whereas Stein's extreme objectivity always threatens to solidify into a machinic process that excludes human judgment and visual knowledge altogether, Moore's precision threatens to dissolve

into a proliferation of detail so minute as to preclude meaningful hierarchies. Moore's precise poetics thereby produces what I call an "empirical sublime," to which it is ethically bound to be faithful, and which it must at the same time manage. Moore's experimentalism thus interrogates the competing uses of precision in the discipline of natural history, as it negotiated its status as a profession in the early twentieth century.

Although the elements of naturalism that "Melanctha" stylizes are less present here, Moore's style is constituted by the performance of precision. In this, and in her distrust of poetic language ("I, too, dislike it," she famously writes), Moore repeats the Zolian imperative to produce knowledge faithfully and without adornment. Spectacle's role in producing and regulating knowledge also returns in this chapter, in the form of the natural history museum, which self-consciously began to move from professionally oriented taxonomic displays toward spectacles explicitly modeled on the panorama, particularly the "museum group," lifelike dioramas with stuffed animal specimens that blended the strategies of illusionism (trompe-l'oeil backdrops, imitation foliage) with an investment in indexicality evidenced by the stuffed animal specimens.¹⁸ The taxonomic and ecological groupings of animals and plants in Moore's poems dramatize competing values of precision in the management of biological diversity specifically and of knowledge generally.

The dissertation concludes with a consideration of William Carlos Williams's late poem *Paterson*, focusing specifically on Book I and its ethnographic gestures toward mapping a local culture. Like the preceding chapters, "Near and Far in *Paterson*" brings into relief the pressures that bear on the possibility of developing an experimentalism that might be applied to humans, in this case to a local culture. *Paterson* undertakes an intellectual project in common with that of the Boasian anthropologists who were ascending to methodological dominance in the United States in the decades leading up to the poem's publication. Like the Boasians, Williams insists on a geographically located culture readable exclusively through present, visible land forms and artifacts. Williams uses the poetic image to render the city of Paterson, New Jersey visually, privileging ekphrasis as a mode—though, importantly, not a form—through which presence, conceived as physically proximate materiality, may be rendered transportable. The fluid transformations between near and far, material and immaterial, person and place, and visual and verbal enacted in *Paterson* all propose euphoric continuities that transcend or exceed form. These continuities are enabled, however, only by the fundamental assumption of deep separations which must exist before they may be overcome; *Paterson*'s ecstatic transformations therefore depend on an almost ascetic renunciation of the nebulous category of the "unknowable," as Williams puts it. Presence is thus posited as the condition of knowledge and, simultaneously, as an epistemic asceticism.

Paterson serves as both an endpoint and an arrow pointing into the postwar period. What I have called the "form of no form" in *Paterson* echoes the Zolian impulse to eschew style, even as it manifests very differently from Zola's own style. Despite its ostensible lack of form, moreover, *Paterson* has been deeply influential for postwar experimental writing, formally as well as intellectually. While it is a long path from Zola's *Nana* to Williams's *Paterson*, the struggle to develop an epistemically virtuous literature constitutes a thread of

continuity from naturalism into modernism that develops variously in the postwar period among writers as diverse as Charles Olson, Larry Eigner, John Ashbery, and Lyn Hejinian. Understanding this continuity helps to account for a number of experimental literature's unusual features, among them its broad formal diversity; its unclear relationship to history (awkwardly yet charmingly captured in a term commonly applied to contemporary experimental literature, "post-avant");¹⁹ the rhetoric of ethics that so often accompanies it; and the tension between clarity and obscurity that attends it. Contemporary experimental literature is often understood as having a vexed relationship to history; it is something that (allegedly) constantly seeks to shed history by "innovating," and yet also part of a literary tradition. By that account, it by definition supersedes ("post-") its historical origins ("advanced" writing, the *avant-garde*).²⁰ The model I propose in this dissertation releases us from that tension by arguing that experimental literature is historical at its root, enabled by a relationship to scientific knowledge that became available in the nineteenth century and has remained powerful in various forms into the present moment. This is a historicity bound to a broader intellectual history, a historicity thicker than a sequence of formal "advances," and one that allows us to see experimental literature's progressivism as itself a product of its historical origins in the philosophy of science of the late nineteenth and early twentieth centuries. The model of experimentalism proposed here likewise accounts for the formal diversity of American experimental writing across the twentieth century. Experimental literature is defined not by particular literary forms but by a commitment to human knowledge, constructed and verified through specific engagements with problematic, unsettled, or changing issues of scientific method whose very unsettledness provides the point of literary access. It can therefore accommodate a broad variety of literary forms, including Marianne Moore's ostentatiously grammatical sentences, the early Gertrude Stein's repetitive, hypergrammatical syntax, and William Carlos Williams's oscillations between fragmentary poetry and fragments of prose, but also Larry Eigner's spatial streams, Lyn Hejinian's incantatory reiterations and permutations, and Susan Howe's visual poetry. By diverse methods, experimental literature seeks a right orientation to objects of knowledge. Above all, the approach I propose here allows us to take experimental literature seriously on its own terms, as an intellectual project of some rigor whose claims to ethical principles, discipline, and clarity belong to a capacious yet coherent literary tradition.

Ultimately, this dissertation argues that American experimental writing commits to a "sense of the real," one that accepts from the start the scientific premise that producing knowledge about reality is a complex undertaking that requires regulation and epistemological guarantees. In this sense it is always a realism that tries to go realism one better, a realism that is not, as Retallack puts it, "naïve" (5).²¹ Far from a poetics of indeterminacy, a radical subjectivism, or a self-involved elitism, experimental writing, with greater or lesser success, invests in the possibility of a literature that can produce determinate, well regulated knowledge of an external reality, however difficult it may be to access that reality. In the case studies that I present here, I hope to demonstrate how the experimental mode cuts across literary-historical categories like naturalism, modernism,

and the avant-garde, manifesting differently in individual cases but producing an identifiable trajectory defined by its epistemic investments. This dissertation is, then, an extended answer to the question that always attends the term “experimental” in contemporary critical usage, *What do you mean by that?* Here, I propose, is what we mean.

Notes to Chapter One

¹ Retallack 3.

² Ezra Pound explicitly proposes such a history in his critical essays, writing in “How to Read,” for instance, that “we could, presumably, apply to the study of literature a little of the common sense that we currently apply to physics or to biology. In poetry there are simple procedures, and there are known discoveries, clearly marked” (19); thus, Pound argues, there ought to be “a twelve-volume anthology in which each poem was chosen...because it contained an invention, a definite contribution to the art of verbal expression” (17). Pound’s Whig history of literature seems to have supplied a model for later discussions of American experimental writing.

³ The question of to what degree, and how, a history of science should treat the notion of progress, is a complex one that has been taken up by every major philosopher of science, from Karl Popper to Thomas Kuhn to Bruno Latour and beyond. My point here is not that there is no such thing as progress in the sciences—such an argument would certainly be beyond the scope of this dissertation—but that what constitutes progress is far from obvious.

⁴ This is not, of course, to argue that Whitman’s long lines are not influential; indeed, Williams explicitly cites Whitman in his critical writings. Rather, the long free verse line means something different as a response to Emerson than it means as a response to Eliot.

⁵ In my period alone, see, for instance, Daniel Albright, *Quantum Poetics*; Ian F. A. Bell, *Critic as Scientist*; Mark Morrisson, *Modern Alchemy*; Marc Manganaro, *Modernist Anthropology*; and Steven Meyer, *Irresistible Dictation*.

⁶ On the category of the “interesting,” see Ngai, “Merely Interesting.” Ngai persuasively argues that the “interesting” renders the aesthetic in cognitive terms, allowing the aesthetic to enter into discussions of form through the back door, as it were. That experimental writing is usually discussed in the terms of “interest” is of course also a symptom of dominant critical tendencies, but these, too, have their roots in the period and the epistemological orientation that this dissertation examines.

⁷ There are, of course, plenty of writers who do believe that literature lends itself well to gel electrophoresis; Christian Bök’s recent, well publicized poetic microbe DNA project (“The Xenotext Experiment”) leaps immediately to mind, for instance. As I have explained elsewhere, these literalists do not belong to the category that I call experimental, but rather to the ‘pataphysical tradition, which I argue is fundamentally distinct from

experimentalism in its orientation toward knowledge. K. Silem Mohammed rightly notes this strain of poetry's "capacity to irritate" (np).

⁸ See in particular Levine, ed., *One Culture*.

⁹ Ernst Mayr offers a number of tragicomic examples of historians assuming the centrality of the physical sciences, to the disparagement of biology, in *The Growth of Biological Thought* (32-3).

¹⁰ I am aware of, and insist upon, the polemical quality of discussing the history of science in terms of "canonicity." Canonicity, as it is now understood in literary criticism, captures the element of contingency that always animates the history of science as well as the broad authoritativeness that it carries.

¹¹ Even Mayr, who proudly champions biology's relative autonomy from the physical sciences, is at pains to note that "[t]he difference between the experimental and the comparative [i.e. in biology] method is not as great as it may appear at first" (31).

¹² Retallack's notion of the "poethical wager" provides a particularly pointed (and unusually self-conscious) instance of the association between literary experiment and ethics, and is in that sense exemplary of the wider phenomenon in contemporary North American experimental poetry.

¹³ On the distinction between science and pseudo-science, see Wallis. Wallis provides an overview of theories of science, detailing the ways in which attempts to demarcate the line between science and pseudo-science have broken down. He therefore argues for a distinction between the *definition* of science, which must be capacious enough to include dubious instances, and the criteria by which sciences are *evaluated* (as methodologically strong or weak). He suggests, moreover, that pseudo-sciences may be identified as theories that are rejected by professional consensus but that fail to "disappear" by attracting a nonprofessional group of enthusiasts. Pseudo-science is defined, in other words, not by methodology but by indirectly related historical circumstances.

¹⁴ The essay does not, in fact, represent Zola's first use of the idea of a scientific literature, but the essays of 1879-80 represent the second, more mature phase in Zola's formulation of the idea, a formulation newly influenced by his reading of Claude Bernard (Mitterand 70).

¹⁵ The essays were first published in the St. Petersburg periodical *Messenger de l'Europe* in 1879, translated into Russian, before their collection in French in *Le Roman expérimental*.

¹⁶ For example: "At this hour, he could know no more, do no more" ("*il ne savait plus, il ne pouvait plus*") (*Nana* 224-5).

¹⁷ I wish to emphasize in particular that concerns about race and gender are not ancillary but central to the history of science, especially in the period and fields of interest to this dissertation. Despite some regrettable trends in some branches of history and philosophy of science (see Haraway's critique in *Modest_Witness@Second_Millennium* 33-6), I would argue that it is not possible to construct an adequate account of the biological and

social sciences in the late nineteenth and early twentieth centuries without addressing questions of race and gender.

¹⁸ The debate over whether to use real stuffed fish, for example, reveals the tension between illusionism and indexicality in the museum group; stuffed fish never looked as much like live fish as did sculptures, but the demands of illusionism were weighed against what was seen as an ethical imperative to display “real” things.

¹⁹ According to Reginald Shepherd, the term “post-avant” (short for “post-avant-garde”) was “either coined seriously by Ron Silliman or parodically by Joan Houlihan” (n.p.).

²⁰ Although a detailed consideration is beyond the scope of this introduction, I wish to touch briefly on the relationship between the categories of experimental, modernist, and avant-garde, since “experimental” and “avant-garde” in particular are often used interchangeably. Experimental literature intersects with the categories of modernism and the historical avant-garde, and is identical to neither. Experimental literature is defined by its epistemic orientation, whereas modernist and avant-garde literature is defined primarily by a relationship to history and to the social body.

²¹ Retallack associates “naïve realisms” with mass culture, in contrast with the wiser realisms of experimental literature. As I hope my chapter on Zola shows, such a distinction does not, in the end, hold up, as elements of mass culture supply the occasion for the radical passivity needed for objective observation.

Chapter Two

A Long and Frightful Kitchen: Naturalism and the Pleasures of Science

“If I had to give a comparison that expressed my feelings about the science of life, I would say that it is a salon resplendent with light, which cannot be reached except by passing through a long and frightful kitchen.”

[“S’il fallait donner une comparaison qui exprimât mon sentiment sur la science de la vie, je dirais que c’est un salon superbe tout resplendissant de lumière, dans lequel on ne peut parvenir qu’en passant par une longue et affreuse cuisine.”]

—Claude Bernard,
Introduction à l’étude de la médecine expérimentale, 1865

“A bit heavy of mind, but [morally] straight”¹ is how Émile Zola describes the count Muffat de Beuville in an early character sketch for *Nana* (1880). The sole aristocrat who actually practices what he preaches, Muffat is the closest thing the novel has to a respectable “straight man,” and in the fifth chapter of *Nana*, he is plunged into a crisis. He is the official attendant of the prince of Scotland, who is in Paris for the 1867 Exposition Universelle.² The prince has been attending the Théâtre des Variétés nightly to watch the beautiful actress Nana perform in *La Blonde Vénus*, an operetta modeled on Jacques Offenbach’s *La Belle Hélène* (Law 637). Unlike the upright Muffat, the prince is thoroughly at ease with the contradictions of traveling to a country both to view the official display of its marvels, and simultaneously going behind the scenes to rent the bodies of its *filles publiques*, a less official source of revenue for France.³ As if reproducing his trip to France in miniature, the prince on this occasion views the show from his seat in the house, then moves behind the curtain to seek out Nana’s sexual services. The underworld behind the curtain is familiar territory for the prince, but for Muffat, the journey backstage is one of discovery, a new venture, and with this shift, Muffat is made into a naturalist.

The “droit” Muffat thus gives us a “straight” version of the naturalist enterprise, as represented by both its proponents and its contemporary detractors. Zola, in his polemical claims to a “scientific” aesthetics, might say that the aim of the naturalist novel, “at times cruel,” is “to go from the known to the unknown” [“aller du connu à l’inconnu”] (*Roman* 25; Becker 178),⁴ in a straight line of inquiry from the exterior of reality to what lies

underneath it, supplanting illusion with reality by supplanting frontstage effect with backstage cause. We can therefore read Muffat's first venture behind the scenes of a theatrical production as an allegory for the venture of discovery that the reader of a naturalist novel embarks upon, a linear penetration behind the smooth spectacle of the social stage that discloses its inner workings, as an anatomist's dissection discloses the machinery of muscle and sinew below the surface of the body.

But instead of finding himself "très intéressé," as the prince is, Muffat is frightened and shocked by what he encounters; "Muffat in particular, who had never visited the backstage of a theater before, was shocked [*s'étonnait*], seized with a malaise, with a vague repugnance mingled with fear" (*Nana* 149).⁵ The world behind the curtain adds physical danger to visual horror, as Muffat is nearly hit by a dropping canvas—the prince, still at ease, alerts him in time. Muffat's discomfort is further magnified by the movement of a board beneath his feet, which makes apparent a hellish literal underworld below the stage, "a subterranean life, with shadowy depths, the voices of men, the breathings of a cellar" (*Nana* 149).⁶ The world of prostitutes and actors into which Muffat accidentally finds himself initiated, far from being a space of enlightenment and technical interest, is hazardous, unstable, and seething with the hidden movements of the stage technicians, who move about like goblins of deception.

Something seems amiss with Muffat's penetration into the underworld, for even if Muffat is a naturalist, he certainly does not carry with him the affectlessness associated with scientific investigation and the "straight" model of the naturalist gaze.⁷ Shock and fear are not the expected response to what amounts to a lot of engineering; the prince's response of interest and cool intellectual engagement seems more normal. Yet it is only Muffat who is making a discovery, only Muffat to whom the scene is new, and only Muffat whom the novel will follow through further encounters with Nana's world. Muffat's is a real enterprise of revelation, and yet, as it turns out, the work of uncovering the machines behind the appearance is one marked by horror. And if Muffat's affective response seems at first blush inappropriate for an assemblage of machinery, it is perhaps supremely appropriate for the reader of the naturalist novel.

So let us step outside the novel for a moment and recollect where we are, and where the unfortunate count Muffat is. Émile Zola was France's most outspoken proponent of a school he called "naturalism," which he theorized in numerous polemical essays (most notably "Le Roman expérimental") as experimental science's novelistic manifestation.⁸ Naturalism was widely attacked as immoral and as gratuitously fascinated by salacious topics, a charge that Zola disdainfully countered by arguing that the naturalist novel reflected reality, and that one might as well ask that a chemist have personal feelings about nitrogen and oxygen as demand that the novelist pass judgment on his characters (*Roman* 126). What his detractors called "low," Zola in his polemics called "real" or "true," suggesting the depth model allegorized by Muffat's encounter with the theater wings. An "impersonal" scientific gaze, we are told, uncovers the reality below the illusion (*Roman* 125). Such polemics constituted a claim that the novel could legitimately participate in scientific inquiry. Zola thereby publicly staked the novel's liberation from certain moral

strictures on a particular model of scientific inquiry, a linear model with the (apparently) self-evidently valuable aim of producing truth. Naturalism could trump conventional morality because it was committed to a stronger ethos, that of a truth that could only be achieved through scientific procedures, available not on the surface but in “low” places.

Zola’s claims for a genuinely scientific “experimental literature,” and the working out of those claims in his novels, I will argue, set the terms for the strain of American literature that has come to be called “experimental.” They do so, moreover, in non-obvious ways. Zola’s polemics have often been read as overblown; indeed, Zola himself intermittently disclaimed their sincerity. Naturalism’s reputation as a popular, even debased literary genre conflicts with the self-conscious ways in which it was propounded as an advance in literary technique—the rhetoric of advance anticipating that of modernist and avant-garde writers—and, indeed, an advance in knowledge of human nature. I wish to take the latter claim seriously and suggest that naturalism’s association with the popular and the “low” is less of a contradiction than might be supposed. As I will show, the problematic nature of Zola’s engagement with the sciences registers the complexity of scientific experiment itself, which in practice did not enact the step-by-step linearity with which it was so often described (by Zola and others). Zola’s explicit concern with the question of what it means to be scientifically experimental discloses the tensions that subsequent literary experimentalism would repeatedly encounter. He anticipates, moreover, stylistic as well as epistemic features of experimental literature, including the aforementioned appeal to an ethics of knowledge, a suspicion of style itself, and a visuality that metonymizes modes of knowledge-production. What I wish to establish here, therefore, is the sense in which Zola’s “experimental novel” was experimental, and the possibilities that it opens up for understanding literature as a form of knowledge-production.

Henri Mitterand has rightly observed that Zola has at least three naturalisms: that propounded in his polemical articles, that evinced by his novels, and that which is demonstrated in his genetic practice (53). But in Muffat’s moment backstage, the three naturalisms seem to meet, for Muffat is the kind of inquirer that, in Zola’s polemics, might be not only the innocent reader, but also the naturalist author. Indeed, in his essay “Du Roman,” which insists on a parallel between the experimental scientist and the naturalist author, Zola specifically uses the investigation of the inner life of the theater as an example of the kind of inquiry that the naturalist must undertake. “Finally, he will visit the places, live a few days in a theater in order to know its smallest hidden corners,” Zola writes (*Roman* 208).⁹ In fact, Zola was probably describing his own tactics in researching *Nana*, which was published contemporaneously with “Du Roman.” The parallel between the ideal naturalist in “Du Roman,” fearlessly seeking out the smallest details of the theaters, and Muffat, tremulously encountering the same, is striking. But unlike Muffat, the naturalist author described in “Du Roman” and Zola’s other polemical essays is affectless, “impersonal,” and certainly not seized by terror at the sight of the moving backstage machinery. What the naturalist author (and implicitly the scientist as well) sees is truth,

unvarnished by affect or moral judgment. What are we to make of these two realizations of one investigative principle?

For an answer, I would propose that Muffat's journey backstage allegorizes not only the naturalist gaze but also the problematic of naturalism. For while the naturalist enterprise is modeled on a linear, revelatory gaze as a manner of "aller du connu à l'inconnu," it reveals, apparently paradoxically, scenes of intense affect and intricate staging, scenes of, as Frank Norris famously put it, "vast and terrible drama" (Norris 1107).¹⁰ Much critical attention has been paid to the question of how to reconcile naturalism's claims to scientific objectivity with its dramatic quality. I would in turn draw attention to the *spectacular* quality of that drama—drama as staged, performed, taken in. For while science ostensibly provides the naturalist¹¹ with a mode of looking that can reveal the world behind the curtain, that revealed world turns out to be a spectacle of science itself. Muffat is thus confronted by "constellations of little bluish stars, in the chaos of the grille and cables of every thickness, catwalks, backdrops spread out in the air like immense sheets of drying laundry" (*Nana* 148-9).¹² The mechanical contrivances of the stage spectacle create the illusion of stars and, simultaneously, an impression of monstrously outsized drying laundry, an image of the working class and a spectacular figure for the grit and grime popularly taken to be the favorite subject of naturalism. Instead of the hoped-for reality that would replace illusion, Muffat encounters an affectively charged, complex apparatus of machinery, gas lights, and other special effects employing the latest technology, what the theater technician J. Moynet called in 1874 "scientific progress applied to the modern stage" (qtd. in Brown 299).¹³ The linear gaze of the naturalist therefore does uncover a "vast and terrible drama," a spectacular truth: not experiment but technology—science applied, science for the stage, a science as pandering and popular as naturalism itself.

The spectacular element that I am pointing out has led many critics to dismiss entirely Zola's claim to be meaningfully engaged with experimental science; science, it is understood, is strictly drama-free. But I would propose instead to revisit the historical terms in which experiment is to be understood, acknowledging that there are powerful narratives about science, Zola's included, that may restrict our apprehension of the manner in which it has circulated in culture. As Michel Serres has observed, the question of whether Zola was "really" scientific has frequently depended on asserting the legitimacy of his relationships to thinkers who have been retrospectively canonized as "real" scientists themselves. But "that which we call the state of a science, at any given moment, only exists by selection," Serres reminds us;¹⁴ the history of science is subject to a process of canonization that depends significantly on the interests of present science (Serres 30). However tendentious Zola's polemics, they invite us to consider that experimental science was not selected arbitrarily as a model for naturalism, that indeed there must have been something about experimental science as Zola understood it that made it an appealing intellectual field on which to found the modern novel. If naturalism is concerned with a scientific gaze and, at the same time, with a spectacular one, then perhaps its apparent contradictions open up for us an opportunity to historically reevaluate science's

relationship to spectacle and the mass culture from which nineteenth century spectacles emerged. I am arguing, in other words, that between his practices and his polemics, Zola articulates a crucial relationship between the procedures of scientific investigation and mass spectatorship—a relationship that can help us make sense of the “experimental novel.” Zola literalized the idea of experimental literature by claiming that the naturalist novel was a new experimental human science, parallel to physiology or sociology. Whether Zola deserves to be counted as a “real” scientist is less important than the questions that his move raises. Under what circumstances can literature be conceived as a kind of human scientific research? What adaptations of experimental protocols would it necessitate? And what morality, epistemology, and affects will such a parallel demand?¹⁵

I. The Experimental Novel and the Novelty of Experiment

Zola’s essay “Le Roman expérimental” has, for better or worse, been taken as the central manifesto of naturalism. It was written in 1879 and first published in translation (in Russian) in the St. Petersburg *Messenger de l’Europe*. The essay and several others, including “Du Roman,” were then brought out in 1880 in a volume titled *Le Roman expérimental* by Zola’s regular publisher, Charpentier, who published *Nana* that same year after its serial run in *Le Voltaire*. The particular set of polemics spanning the years 1879 to 1881, Henri Mitterand argues, is firmly to be distinguished from the version of the experimental novel advanced by Zola in 1866.¹⁶ It was also written in precisely the same time frame as *Nana*—hence the description of investigating a theater in “Du Roman” (20). These essays thus not only benefit from Zola’s later scientific readings, but also represent a theoretical counterpart to actual experimental novels like *Nana*. The programmatic quality of “Le Roman expérimental” in particular has made it a popular site of scrutiny, especially because it closely engages Claude Bernard’s *Introduction à l’étude de la médecine expérimentale* (1865). In answering the great question of whether Zola is scientific, Bernard is one of the primary “real scientists” to whom critics have directed their attention. This is not without reason; Zola himself often calls on Bernard as a scientific authority, and therefore as a source of legitimation. The authority attributed to science is the source of the authority that Zola in many places claims for the experimental novel. By aligning the experimental novel with a scientific enterprise, Zola can make substantial social claims for his work, writing, “Our goal is theirs [the scientists’]; we wish, we too, to be masters of the phenomena of intellectual and personal elements in order to direct them” (Becker 177).¹⁷ This rhetoric of mastery is imported in large part from Bernard and is consistent with popular contemporary notions of scientific authority and efficacy.

But Zola’s engagement with the *Introduction* is far more complicated than merely partaking of its pro-science and pro-progress polemics, although these elements are important. For in the process of being pro-science and pro-progress, Zola pointedly reveals the ways in which both science and its progress were subject not only to extension but also to revision. Bernard’s *Introduction* is partly a theory of experimental medicine and partly a defense of the very idea that an experimental medicine could and ought to exist, a defense

to which Zola explicitly points as an antecedent to the idea of the experimental novel. A curious example from the *Introduction* helps illustrate the way in which developments in the sciences may be read as actively *calling for* a naturalism—as, indeed, Zola claimed they did. Quite early in the *Introduction*, Bernard reflects on the practice of science, noting that it has frequently been compared to a physical struggle across rocky mountain crags that gives one access to a flowery, sunlit plateau. Bernard, however, prefers another metaphor. “If I had to give a comparison that expressed my feelings about the science of life,” Bernard writes, “I would say that it is a salon resplendent with light, which cannot be reached except by passing through a long and frightful kitchen” (28).¹⁸ Bernard’s revision is striking. By domesticating the metaphor, Bernard replaces a scientific narrative of physical heroism with one of affective endurance. And as if anticipating Zola’s claim that to reveal the truth, one must delve into the dirt and grime of humanity (*Roman* 25), Bernard figures the experimental process as inevitably located in a kitchen, a site that, like the image of drying laundry, evokes the working class, in contrast with the well lit bourgeois salon. Thus an outdoor struggle with nature is rendered internal and suddenly subject to class distinctions. If there is no longer an image of physical striving, there remains nonetheless the necessity of getting one’s hands dirty, distastefully so. Labor in the kitchen, however repulsive, makes it possible to dwell in the salon. Experimental medicine is therefore conceived in the terms of the domestic and the social—of separate zones of the house, mapped according to social classes and a host of moral and affective associations. The metaphor of the “long and frightful kitchen” represents one of many shifts in emphasis that Bernard makes to disclose science’s openness to reconception. Even if Zola himself occasionally represents “Le Roman expérimental” as a pure co-optation of authoritative Bernardian ideas, it would be a mistake to regard authoritativeness as the “real” scientist’s primary contribution to the essay. Rather, by advancing a new experimental field, Bernard insists on the historical and constantly changing state of the sciences, a far more useful idea for Zola. I wish to explore here three moves in Bernard’s work that I consider to be particularly crucial to Zola’s formulation of an experimental novel. First, Bernard argues for the extensibility of the experimental method to wider domains, and in particular for an expansion from inanimate objects to living subjects, including human beings. Second, he revises the semantic content of the term “*expérience*” to foreground the subjectivity of the person conducting the research. And finally, Bernard theorizes that experimental subjectivity in a way that proves instrumental for Zola.

In the *Introduction*, in a move not atypical for the period, Bernard makes experimental methodology virtually synonymous with modernity by foregrounding an evolutionary notion of scientific disciplines. “Merely by the natural progress of its evolution,” he writes, “[medicine] abandons bit by bit the region of systems [i.e. empiricism] to take on more and more the analytic form, and thus gradually enter into the investigative method common to the experimental sciences” (6).¹⁹ Experiment, Bernard argues, is the future of medicine. In general, he adds, even if a science should begin as purely observational, an experimental state is one to which it may yet aspire (and indeed, evolve).²⁰ Bernard therefore frames experimental methodology as the engine of progress—an

engine available to nearly any science, including medicine. As Zola puts it in “Le Roman expérimental,” “Since medicine, which was an art, is becoming a science, why should not literature itself become a science, thanks to the experimental method?” (Becker 181).²¹ And indeed, in Bernard’s view, not only is experiment the future of medicine, but medicine is also the future of experiment, as we learn when, in a move similar to the one that Zola makes fifteen years later, he disclaims any theoretical innovation and explains that his *Introduction* merely applies to medicine methodologies that have long existed in the physical sciences (9). In “Le Roman expérimental,” Zola specifically points to it as evidence that the time is ripe for an experimental novel. Bernard’s extension of experimental methodology from physics and chemistry to medicine indicates precisely that it was extensible, an implication that would have been supported by the emergence of a number of other sciences, particularly anthropology, sociology, and psychology, which began to institutionalize in the nineteenth century.²² Moreover, it easily suggests a further step toward a novelistic science of the mind and behavior. “I shall attempt to prove in my turn,” Zola writes,

that if the experimental method leads to knowledge of physical life, it may also lead to knowledge of passion and intellectual life. It is only a question of gradation on the same scale from chemistry to physiology, and then from physiology to anthropology and sociology. The experimental novel comes at the end (Becker 162-3).²³

Zola argued that this extension was not only reasonable but practically fated, a manner of “obeying the general evolution of the age” (Becker 182).²⁴ We can see how not only science in general but experiment in particular is bound up in a narrative of progress for both Bernard and Zola—one inevitably concomitant with a sense of constant change. The progress narrative is, moreover, strategic. Bernard’s modest gesture, repeated and extended by Zola, cedes authority to the canonical center of experimental science, the physical sciences, only to suggest that an authoritative essence of experimentalism is unproblematically portable outside the disciplines in which it was developed.

Bernard thus cultivates the notion of a portable experimentalism that both can and must spread to new areas of human inquiry. But in order to make experimental methodology available to a broad range of disciplines, Bernard must revise the terms by which it is defined, particularly “observation” and “experiment,” two terms generally understood in opposition to one another.²⁵ Bernard takes it upon himself to trouble the common wisdom that observation is experiment’s less advanced, less insightful inverse, arguing instead that at the level of practice, the two terms are almost inseparable. Critiquing a widely accepted definition of experiment as active and of observation as passive, Bernard insists that the material point in defining activity and passivity lies not in the *hand* of the investigator, but rather in the *mind*, and that experiment and observation therefore do not align with activity and passivity (13-4). Instead, Bernard aligns observation and experiment with kinds of data sets, one taken from a normal or natural state and the other taken as the result of an induced variation in the normal state. On both

observational and experimental data sets, an investigator may exercise what Bernard calls “experimental reason” [*raisonnement expérimental*], which is invariant across scientific disciplines, including both “experimental” and “observational” sciences (Bernard 24). Bernard thus redirects attention from the apparatuses of experiment to the mental processes of the experimenter. The distinction between observation and experience for Bernard is more about ways of thinking than about ways of acting. Experimental reason allows Bernard to preserve an experimentalism across specific disciplines, by locating experimentalism in the scientist himself.²⁶ Experiment thus becomes a matter of what Lorraine Daston and Peter Galison call “epistemic virtues,” qualities of the scientist that make him capable of reliably producing knowledge. As we will see, the epistemic virtue that most concerns Bernard is objectivity, which must, for the Bernardian experimenter, be cultivated complexly and ambivalently.

This shift in attention from specific experimental procedures to an experimentalism harmonizes with the way that Bernard argues for a more abstract usage of the term *expérience*, which in French denotes both experience and experiment. Capitalizing on the double meaning in French, Bernard asks his readers to reconceive *expérience* as the instruction one gains by applying reason to the facts gained through life and praxis (Bernard 21-2).²⁷ Bernard therefore brings the term *expérience* closer to its colloquial usage, arguing that the scientific use of the term (to denote experiment) has always been a special, formalized case of the more general use (to denote experience) (Bernard 24). That such a move brings the concept of “experiment” closer to the kinds of practices already associated with the art of fiction—the recording of experience—is less important, however, than the way it reveals the term’s malleability. Not only does the substance of Bernard’s revision of key terms seem to authorize an experimental literature; it also shows how these terms were subject to revision within science itself, positioning science as a publicly contestable domain of inquiry that was undergoing constant development.

Bernard’s reconception of experiment, and particularly its location in the mind of the scientist, reveals that, despite protestations to the contrary, neither experimental medicine nor any other human science simply applied a stable existing experimental methodology to a new domain.²⁸ Every new science necessarily introduces new phenomena and new theoretical considerations. Thus there is not only a question of how experiment will change the (formerly pre-experimental) field, but of how the new field will change the way in which experiment is understood, a fact of which Zola was cannily aware. “Behind a science, behind any manifestation whatever of human intelligence,” he writes, “there is always, whatever Claude Bernard may say, a more or less clear-cut philosophical system”; thus a new science with a new object of study always has broader implications (Becker 191).²⁹

Though not avowed as such, one of the broader implications of experimental medicine was a need to reconceive experiment as something pertaining to the scientist himself, warranting a theory of experimental subjectivity. The theory that Bernard offers locates both experimental and observational modes in a single oscillating mind. While Bernard acknowledges that experiment cannot proceed or even be conceived without the

postulation of hypotheses, these are to be maintained radically separate from the recording of data, which take place in a strictly observational spirit:

The experimenter must then disappear, or rather instantly transform himself into an observer; and it is only after he has reported the results of the experiment just like those of an ordinary observation that his mind [*esprit*] will return to reason, compare, and judge whether the experimental hypothesis is verified or falsified by those results. (41)³⁰

Bernard thus describes a strictly bifurcated investigative subject who, in one moment, creatively and actively designs experiments and, in the next, becomes a ghostly, disappearing figure, erasing the self in order to keep the data pure. “The observer must be the photographer of phenomena,” Bernard writes; “his observation must represent nature exactly. It is necessary to observe free from preconceived ideas; the mind of the observer must be passive, that is, keep quiet; he listens to natures and writes under her dictation” (39-40).³¹ This insistence on exact, even mechanical reproduction is typical of what Lorraine Daston and Peter Galison have termed “mechanical objectivity,” a mode of objectivity that rose to prominence in the later nineteenth century and which functioned, they argue, as all forms of objectivity do, by the moralized suppression of some aspect of subjectivity. In this case what is suppressed was “the subjectivity of scientific and aesthetic judgment, dogmatic system-building, and anthropomorphism” (“Image” 82), which a reliance on mechanical apparatuses like the camera is supposed to combat.

Bernard goes so far as to illustrate his point with the example of François Huber, a blind naturalist who played the role of active experimentalist while his servant, a sighted man possessing “not a single scientific idea,” would act as the passive collector of data.³² Thus “Huber was therefore the directing mind that instituted the experiment, but he was obliged to borrow the senses of another. The servant represented the passive senses that obey the intelligence in order to realize an experiment that was instituted in view of a preconceived idea [hypothesis]” (43).³³ The choice of examples not only reveals the total quality of the conceived split in the experimental subject—apparently it may extend over two entirely different bodies with a division of labor along class lines—but also suggests the precariousness of the ideology that subtends this particular experimental project. One must pass through a long and frightful kitchen, but it is possible, and indeed perhaps scientifically preferable, to “borrow the senses” of a radically passive servant, who can do it in one’s stead—the servant of course (problematically) standing in for a mechanical apparatus.³⁴

Bernard presents Huber and his assistant as an extreme example, of course. The bifurcated experimental/observational subjectivity of the experimental scientist is in general conceived as belonging to a single person; indeed, Bernard writes explicitly of a “savant complet” [“whole scientist”] who is able to encompass both extremes (43). And although Daston and Galison point to mechanical apparatuses like the photograph and the X-ray as guarantees against subjective intervention, Bernard tends to emphasize a transformative automatization of the self, describing the experimental scientist at times as a

kind of spirit medium who receives images from nature and transmits them to posterity. Even the “active,” hypothesizing aspect of the experimental scientist takes a kind of dictation from nature, designing experiments “following the various hypotheses that are suggested to him” (40).³⁵ Zola follows suit and approvingly quotes Bernard’s aforementioned description of the observer as “le photographe des phénomènes,” etc., a description that imagines the observer as a mechanical or sybilline medium for nature’s communiqués (*Roman* 6-7). Thus for Zola as for Bernard, the investigator must undergo transformations akin to disappearance, conceived as total self-abnegation. And if that abnegation is in one sense seen as the self-disciplined “observation” of the preternaturally aware scientist, it is remarkable how easily that self-discipline slips into a self-mechanization made possible by the metaphorical spirit-possession of taking dictation from nature—a mechanization that we will see elaborated in Gertrude Stein’s work. Bernard’s account of experimental science thus turns significantly on a study of a particular set of moral and affective states. What we ought to notice about the kind of experimentalism that Zola extracts from Bernard is, first, that it makes gestures toward a portable, authoritative scientific method in order to reveal those methods as subject to revision. And second, insofar as he really does invest to a portable, transdisciplinary experimentalism, that experimentalism is located less in particular procedures than in the character of the scientist. While Zola occasionally treats Bernard as the authorizing, legitimate scientist or “base solide” on which to establish his theory of the experimental novel (*Roman* 1), he is a strategic reader of Bernard. Indeed, the most authorizing moves that Bernard makes are those that represent experimental science as far from a “base solide”—as something requiring constant rethinking and revision, as something historical and subject to progress, extension, and adaptation, and as determined at a fundamental level by a problem of subjectivity. It is according to this understanding of experimental science that, by fashioning a naturalist author whose “personal feeling...must be subject to the control of truth” (Becker 195),³⁶ Zola can fashion a naturalism.

II. Science as Spectacle

Far less explicit in Zola’s polemics are the ways in which experimental science might prove a useful model for the modern novel not only because it was rigorous or controlled but also because it was pleasurable and amusing. I wish to establish in this section that public spectacles occasioned ways of looking that consciously emulated and were in some cases identical to forms of scientific observation. Spectacles did not so much adulterate a pure and sober science as exploit the spectacular potential already present in scientific experiment, which had a long history of demonstration and display of greater or lesser publicness.³⁷ Public “demonstrations” of recent scientific findings had long been a source of entertainment in Europe, and these continued to expand and flourish in the nineteenth century. The work of the Italian physiologist Luigi Galvani, for instance, which famously involved applying an electrical current to a dead frog in order to make it move as if alive (“galvanized”), was repeatedly demonstrated as public entertainment by his nephew,

Giovanni Aldini (who also developed an early shock therapy treatment for the mentally ill) (Warner 4). Franz Mesmer's theories of "animal magnetism," long entertained by eminent scientists, were demonstrated in private séances and widely popularized (Higonnet 128). And in 1838, the Royal Polytechnic Institute in London (now the University of Westminster) opened, regularly demonstrating new technological and scientific developments and running a popular magic lantern show until 1876 (Warner 155).³⁸ Moreover, as the sciences expanded their purview to human bodies, minds, and social formations, these too became part of public spectacle. Vanessa Schwartz has detailed the stunning popularity of the Paris morgue as a public spectacle in her *Spectacular Realities*; more officially, the dissected genitalia of Sarah Bartmann (Saartje Baartman), sensationally known as the "Hottentot Venus," were put on display in Paris's Musée de l'Homme after her decease in 1815 (Gilman 85-8). Public demonstrations were a practical way of disseminating scientific knowledge to a lay audience, but also a form of often sensational entertainment.

A public spectacle that attempts to disseminate (some version of) scientific knowledge is of course not an experiment in the professional sense of the word (indeed, the spectacle is explicitly popular, not professional). But the relationship between popular and professional science was more symbiotic than might at first be apparent, especially in the case of incipient sciences. Electricity, for example, was frequently investigated not only by élite professionals but also by what Iwan Rhys Morus has called "electricians," serious scientific practitioners who "made no distinction between display and discovery" (52). As the example of the phantasmagoria (below) will indicate, the semantic slippage between "demonstration" as a kind of rigorous proof and "demonstration" as a kind of spectacle meant that experiment and spectacle were hardly segregated practices. Nor was spectacle always entirely derivative of experiments carried out earlier and elsewhere; the culture of spectacle also influenced what counted as a good experimental result. As James A. Secord, writing about the physical sciences in Britain, has pointed out, there was a "tradition of experimental physics grounded in lecture demonstration and public display" in the eighteenth and nineteenth centuries, such that scientists consciously "conducted their original laboratory researches so as to provide striking visual effects to a wide audience" ("Quick" n.p.). The result was a domain of popular culture in which experiment blended with both pedagogy and entertainment.³⁹ Scientific experiment thus often took the form of a demonstration, such that the "techniques of the observer," to use Jonathan Crary's phrase, that characterized the spectacle-goer often coincided with the techniques of observation necessary for scientific processes of verification. Schwartz has observed that Paris in the later nineteenth century was widely identified with its many mass spectacles, including the theater and pre-cinematic optical displays like the panorama and diorama, wax museums, and broader "distractions" like the six world expositions that the city hosted over the course of the long nineteenth century ("Cinematic Spectatorship" 297). Schwartz argues, moreover, that "real life was experienced as a show at the same time that shows became increasingly lifelike." This simulacral reality-effect depended in part on the exploitation (and sometimes conflation) of scientific and technological wonders.⁴⁰ Or

rather, what many of these spectacles exploited was a paradox that was already present in science itself, namely science's capacity to establish the reality of the counterintuitive and the extrasensory, to produce illusion as well as to debunk it. Among these entertainments, I would highlight two in particular, the phantasmagoria and the panorama, which occasioned two separate modes of looking.⁴¹

The phantasmagoria ("fantasmagorie") emerged in the wake of the Terror when the Belgian physicist Etienne-Gaspard Robert (later Robertson) developed the first magic lantern show to use a bright oil lantern.⁴² Although the phantasmagoria was by no means the first or only spectacle of projection, it took these shows to a new level with moving images and eerie sound effects (including a glass harmonica), and enjoyed broad popularity. Robert projected images onto a scrim, or sometimes a cloud of smoke, which was positioned between the lantern and the audience. Unlike spectacles like the diorama, the phantasmagorias were often projected in non-theatrical settings, most famously in the abandoned gothic Couvent des Capucines, where Robert projected images inspired by myth and folklore as well as by the Terror (the severed head of Danton projected onto smoke, for instance) (Higgonet 5; Warner 147-8). The phantasmagoria employed a number of optical effects in order to deliberately evoke the supernatural, but Robert insisted that his show debunked the supernatural by exposing it as mechanically produced (Warner 153). Indeed, one advertisement for Robert's phantasmagoria plays up the scientific, illusory quality of the show, declaring that "[t]he room in which the public gathers to await the *expériences* of the phantasmagoria offers the latest optics for tricking the eyes."⁴³ Offered in the same show are "*EXPÉRIENCES* on the Galvanic fluid that brings not only movement but also mannerisms to bodies that have been deprived of life for days."⁴⁴ The advertisement does carelessly what Claude Bernard would later do conscientiously: it conflates the two French senses of "expérience" by placing the audience's "expériences" of phantasmagoria on the same level as the "EXPÉRIENCES" in galvanizing dead flesh—for indeed, in the context of the show, both were scientific demonstrations, and both, at the same time, elicited visceral sensations in the audience. What the slippage reveals is that both senses of "expérience" were aimed at producing sensations that were pleurably incongruous with reality.

Although the phantasmagoria, as a technology of projection, has been given significant attention as a precursor to the cinema,⁴⁵ it is important to acknowledge the elements of the phantasmagoric display that cannot easily be mapped onto the cinema—the setting in the convent, for instance, or the other demonstrations that accompanied the projection show. The mode of looking occasioned by the phantasmagoria is one that might be characterized as a "mobilized gaze," to use Anne Friedberg's term, for the projection itself was always only part of the spectacle. It is therefore not surprising that the phantasmagoria was borrowed by Walter Benjamin as a metaphor for a specifically modern relation to commodities in the *Arcades Project*, his unfinished project on nineteenth century Paris.⁴⁶ Margaret Cohen suggests that Benjamin takes up the phantasmagoria in order to refine Marx's image of the camera obscura as a metaphor for ideology. While the camera obscura projects an image of the world upside-down, inverting the order of things, the

phantasmagoria projects something altogether new. The camera obscura is therefore both truer to life, deriving its image from the pre-existing world, and more clearly a distortion. “While the *camera obscura* does not attempt to fool its audience into mistaking its two-dimensional inversions of reality for the outside world, the phantasmagoria endows its creations with a spectral reality of their own,” Cohen notes. “Robertson’s phantasmagoria expresses not only the non-mimetic inflection that Benjamin works on Marx’s representation of ideology as the *camera obscura*, but also the content of Benjamin’s own relation to these representations” (94). Benjamin sees the phantasmagoria as a visual experience that stands in for particular ways of knowing the world, which he (like Friedberg after him) associated with the physical forms of the modern city, and particularly that place of transit, the arcade. In the phantasmagoria, the projection of illusions and the mobilization of the gaze converge to constitute an affectively charged *expérience*. Although it emerged at the end of the eighteenth century, the phantasmagoria and variations on it remained popular spectacles across Europe throughout the nineteenth century (Warner 155).

The panorama, originally a British invention, arrived in Paris shortly after the phantasmagoria.⁴⁷ In 1799, Robert Fulton, the American possessor of foreign patents for the panorama (and inventor of the steamboat), erected a pair of rotundas on the boulevard Montmartre. Each rotunda contained a vast cylindrical painting by which the viewers were enveloped; one represented a view of Paris from the Tuileries, while the other represented the British retreat from the 1793 Battle of Toulon (Schwartz 151). Inside the panorama, the viewer was presented with a 360-degree view of some scene, usually, early on, a landscape, cityscape, or battle scene. By tiny, carefully calculated gradations in perspective, the panorama mimicked the effect of being in another place, such that it was often invoked as a substitute for travel, and indeed, panoramas representing Antwerp, London, Jerusalem, and Athens appeared soon after the first panoramas (Schwartz 151, 153).⁴⁸ Like the phantasmagoria, the panoramas made use of new technologies in presenting illusions. In addition to simulating gradations of perspective, they were lit from above by a skylight similar to the one that would, a year later, illuminate the passage des Panoramas, one of the earliest Paris arcades (Friedberg 25). Although a skylight may no longer seem like much in the way of technology, Benjamin draws our attention to the novelty, in the late eighteenth century, of the kind of iron-and-glass construction (*Eisenbau*) that enabled the building of such skylights and some of the most distinctive architecture of the nineteenth century, including les Halles, the Gare Saint-Lazare, and London’s Crystal Palace.⁴⁹ But more important than the technology per se was what it could do; the late eighteenth-century panorama was seen as a highly sophisticated medium for representing reality. Its status as a technological wonder was established in 1800 by a special commission of French scientists, mathematicians, and specialists in arts and letters, who submitted a report on the panorama that pronounced it an “*intéressante découverte*” (Buddemeier 164). The early panoramas thus drew on an eighteenth-century tradition of landscape painting and the taking of “views” from above in travel, and usually placed the viewer above the scene, looking down (Schwartz 151). As the French commission put it, a panorama painter must

“choose a quite elevated spot in order to see all points of the horizon and at the same time perceive the details to be found at the foot of the elevation on which he is placed” (Buddemeier 166).⁵⁰ The aesthetic of the early panoramas offers a useful counterpoint to the kind of viewing that concerned Bernard, for as the commission recommends, the panorama painter must use judgment to place the most interesting objects in the foreground, “under an advantageous aspect and in the position most suited to give a piquant effect,” not so much for aesthetic purposes as for scientific ones, “in order to give a just idea and the physiognomy, so to speak, of the country that he wishes to represent.”⁵¹ A “just” representation of the landscape’s “physiognomy” is, according to this model, one that works, as Daston and Galison put it, to “determine the essential” rather than to reproduce mechanically (*Objectivity* 66). At the end of the eighteenth century, in other words, the panorama thoroughly accorded with scientific ideals of representation that by the end of the nineteenth century would have undergone significant changes for many prominent scientists, Claude Bernard among them.

The phantasmagoria and panorama both used new technology to control light and produce optical illusions, from ghosts to Napoleonic victories. Anne Friedberg classes such spectacles together in contradistinction to optical toys like the zooscope, phenakistoscope, and the stereoscope because, unlike the latter category, the former spectacles hide their technical apparatuses in order to “produc[e] an illusion of unmediated referentiality” (Friedberg 23). While Friedberg rightly emphasizes the distinct mechanisms by which the two categories of entertainment produced optical illusions, I would emphasize that the verisimilitude of the phantasmagoria, panorama, and diorama served to produce a sensation as much of artificiality as of reality. As Dolf Sternberger notes of the panorama, “such deception is not meant to deceive...but to exist for its own sake, and it is content to amaze the viewer” (qtd. in Friedberg 216n). As Schwartz puts it, “Panoramas ... offered the art of deception and never willfully deceived without the spectator’s participation. Yet the illusion lay not so much in the actual quality of the panorama’s realistic representation of a particular place...as in its technological illusionism” (Schwartz 153). Like Aldini’s galvanized animal corpses, the phantasmagoria, panorama, and diorama emphasized the rupture between sensory experience and common sense—between the impression given by a panorama that one is in Athens and the knowledge that one is in Paris, for instance, or between the impression that an animal is alive and the knowledge that it is “really” dead. Public spectacles trained the eye to see the unbelievable. This sublime rupture characterized science itself as well as scientific spectacles like galvanic demonstrations. For science, undergirded by experimental protocols designed to ensure the accuracy and reliability of its results, revealed that people who appeared healthy were really degenerate and ill; that people who appeared “white” were really “black”; that behaviors that felt intentional were really determined by an unknowable unconscious. By making a powerful claim to establish reality, experimental science paradoxically confused the boundaries of the real, calling into question the reliability of the very senses on which it depended. Through public spectacles and demonstrations, in short, science suggested that *reality is not verisimilar*, generating a sublime vertigo that was, in the end—very entertaining.⁵² Thus we

need not be surprised when Zola, quoting Claude Bernard, describes the spectacularly scientific naturalist novel as “une expérience ‘pour voir’” (*Roman* 7).

III. The Phantasmagoria of Investigation

I have argued above that, despite occasional protestations to the contrary, Zola locates the essence of experimentalism in the character of the investigator; the investigator must have certain virtues of experimental reason that will guarantee the validity of his findings. I have argued, further, that public spectacles modeled scientific ways of looking. I wish, then, to examine the character and the ways of looking that belong to *Nana*'s central investigative figure, Muffat. In “Le Roman expérimental,” Zola repeatedly gestures toward a highly mechanistic, linear, step-by-step process of experimentalism, one that imagines an experimenter who embodies the ideals of mechanical objectivity, a capacity to see and record what is visible exactly, untiringly, and without the intervention of the will or imagination. Yet those ideals are best realized, Zola suggests, only when objectivity is enforced by an overpowering spectacular reality that renders the investigator helplessly passive before it. Muffat's investigations dramatize the tension between the linear model of experimentation, figured by direct viewing, and the experimentalism of “tâtonnement,” as Bernard puts it, which is characterized by a distracted, phantasmagoric mode of looking.

As the intimate relation between spectacle and science I have described suggests, when Muffat proceeds to the wings of the theater, his affective response of fear is not as aberrant as Zola's description of the “impersonal” novelist-investigator in “Du Roman” would suggest. Instead, the dyad of the prince and Muffat, the “très intéressé” and the horrified, mimics the double nature of science as both demystification and spectacle. But the affectless, interested prince is a minor character in the novel, and not, indeed, of much interest to Zola. The prince penetrates the *envers du théâtre* in order to acquire Nana sexually; like the paradigmatic “impersonnel” investigator of the theater of “Du Roman,” by investigating the *envers*, the prince “forces nature to unveil herself, in attacking her,” as Claude Bernard provisionally describes the investigative act in his *Introduction* (41).⁵³ This unveiling is literalized when the theater owner, Bordenave, unceremoniously shows the prince and Muffat into the half-undressed Nana's loge.⁵⁴

But though the prince at first seems to fit the bill of the scientific-minded, naturalist investigator, it is Muffat's subjectivity that is of interest to the novel. As so many critics and contemporaries have complained of Zola's naturalist polemics, the prince and his affectless interest are not, in the end, very interesting, in part because the reality that the prince unveils is precisely unsurprising: a popular actress who will stand undressed on the command of the more powerful men who employ her. In taking the prince on as a customer, Nana only does the expected, even the inevitable. The relationship between the prince and Nana is barely narrated, because barely worth narrating. This means that the prince and his gaze are not very dramatic, not very exciting, not very novel-worthy. It equally, however, means that they are not very scientific. For if experiment aims to “aller du connu à l'inconnu” (*Roman* 25), the prince's sexualized gaze merely retreads the *connu*:

a powerful man, a young prostituted woman; the master, the mastered; the knower, the known. In other words, while the prince's gaze might have been mistaken for the *ideal* scientific gaze, its monolithic *a priori* mastery has the comprehensiveness of fact without the crucial, defining feature of the experimental novel itself—experiment. Indeed, Claude Bernard's model of experiment requires a kind of bifurcated identity in the investigator that first actively devises an experiment and then passively and even self-abnegatingly records its results (Bernard 42). If, at one moment, the scientist is in control, constructing experimental conditions and setting them in motion, at the next moment the scientist must be transformed into an observer, who "should be passive, that is, shut up; he listens to nature and takes down her dictation."⁵⁵ The prince's consistency, his smooth passage from house to wings to the half-nude Nana, the predictability, and indeed, predictedness (by Nana, Bordenave, and others) of his progress leave no room for such necessary relinquishments of control, so that, far from being the ideal experimental scientist (or experimental novelist, for that matter), the prince merely penetrates, merely dominates.

Unlike the prince, who casually treads a familiar path, Muffat undertakes a real discovery, and is *appropriately* paralyzed by the spectacle before him. Indeed, as Muffat's scientific act turns spectacular, the investigative project is revealed to be, not the demystification of spectacle, but demystification *as a form of* spectacle. The very act of revealing the theater's inner workings is frighteningly spectacular. At the same time, Muffat, the straight believer in straight narratives, continues to search the *envers du théâtre* for the kind of reality that Zola, in essays like "Le Roman expérimental" and "Du Roman," assures his public can be found there. When the theater wings yield only a terrifying technological spectacle of gas-lights, and ultimately Nana herself, Muffat peels back layer after spatial layer. First in the passage des Panoramas, and then in the street, the investigative logic of the *envers* is increasingly projected outward, until all of Haussmann's Paris becomes a gas-lit phantasmagoria.⁵⁶ In successive scenes of investigation, phantasmagoria repeatedly complicates the "straight" experimental gaze with which Muffat is supposedly equipped, and, moreover, it is precisely this complication that enables experiment.

Muffat's investigations spatially dramatize the depth model that "Le Roman expérimental" evokes by beginning in the self-consciously illusionistic theater, then moving behind the theater into the dilapidated arcade where the artists' exit is located, the *passage des Panoramas*, and finally in the surrounding, newly Haussmannized boulevards. Each of these locations thus becomes another kind of *envers du théâtre* for Muffat to penetrate, and yet these sites of demystification inevitably turn out to be sites of phantasmagoric spectacle. In the oneiric seventh chapter of the novel, a chapter at the novel's very center, Muffat moves behind the Théâtre des Variétés and into the grimy passage des Panoramas. Muffat has successfully established himself as the reluctant Nana's lover (she sleeps with him grimly, "sans plaisir" [Nana 202]); he has therefore ostensibly mastered the embodied spectacle who is the toast of Paris. Yet Nana immediately proves unreliable, evading Muffat and lying about her plans. In an attempt to pin Nana down, Muffat finds himself wandering the gas-lit arcade near the artists' exit, looking to the back of the theater to

supply the truth about the woman whose name has lately been emblazoned on the theater's front (*Nana* 33). Making of the arcade a scene of investigation, Muffat determines, "Nana would emerge; he would exact the truth" (206).⁵⁷ This is in effect Muffat's experimental design, characterized by willpower and intention. Muffat plans to "exact the truth" first by lurking in the arcade, then by means of questioning. Muffat is in the arcade for a specific purpose, a "straight" purpose conceived as a gaze fixed on Nana; indeed, it is with the thought of his purpose that Muffat wrenches his gaze away from the distraction of a restaurant window. Muffat thus thinks of his task as intentional and linear, distinguished by a focused and undistracted gaze and a plan to be carried out step by intentional step. In this gesture, Muffat attempts to make himself into an ideal objective observer, with superhuman powers of attention.

But as Muffat's momentary fascination with the salmon in the restaurant window suggests, the arcade is not a good place for linear gazes. Instead, it is a distinctly phantasmagoric environment:

It was, under the panes whitened with reflections, a violent glare, an ooze of lights [*clartés*], of white globes, of red lanterns, of blue transparencies, of brackets of gas, of giant watches and fans in strokes of flame burning in the air, and the splash of colors of the window displays, the gold of the jewelers, the crystal of the confectioners, the bright silks of the milliners flamed up behind the purity of the glass, in the bare light of the reflectors; meanwhile, among the painted hodgepodge of signage, an enormous purple glove resembled, at a distance, a bleeding severed hand [*main saignante*] attached by a yellow cuff. (205).⁵⁸

Effects of gaslight and glass distort the images of objects for sale in the windows, with "des montres et des éventails géants" ["giant watches and fans"]. The light's trick of rendering a commodity, a glove, as "a bleeding severed hand" evokes violent dismemberment and Etienne-Gaspard Robert's phantasmagoria, with its bloody images of the Terror.⁵⁹ The evocation is strengthened by the arcade itself; although the passage des Panoramas is not exactly an abandoned gothic convent, in the context of the Second Empire in which the novel is set, the arcade is a modern ruin, hailing from the period of the phantasmagoria (built in 1800) and now in a period of decay. Although Europe saw a renaissance of arcades at the end of the nineteenth century, with vast, luxurious proto-shopping malls being constructed in Brussels, Budapest, and Berlin, the much older passage des Panoramas was a more modest affair. As one of the earliest Paris arcades, the passage des Panoramas was the kind of arcade that had, by the Second Empire, "declined into sordid and miserly alleyways where the air stagnated in obscure recesses" (Buse et al. 14-5).⁶⁰ By the time of *Nana*, the passage des Panoramas is, like the Couvent des Capucines, left over from an old order, a haunted space. That it is also a crowded space — a "cohue" of people taking shelter from the rain has filled the arcade — only increases its spectacular quality; one would not, after all, take in a public spectacle in solitude.

The phantasmagoric quality of the arcade inspires fear and anxiety, turning Muffat's intended linear gaze into what Friedberg calls a "mobilized gaze."⁶¹ Awkwardly pretending to shop in the semi-public space of the arcade, Muffat shifts his gaze from one grotesque window display to another, even pretending to examine a row of small windows above the shops, "as if seeing them for the first time" (207).⁶² But the discomfort and fear that disrupt the linearity of Muffat's gaze ironically also enable him to acquire the very knowledge that he seeks; distraction itself becomes productive. For one thing, after over an hour of wandering, Muffat seizes on a plan for verifying Nana's presence in the theater that is far more explicitly experimental than the original vague plan to wait for Nana and "exact the truth." It is experimental in that Muffat relies on visible exterior phenomena as signs of the invisible interior, acknowledging the fundamental premise of experiment—that what is not self-evident must be revealed through induced signs. Muffat peers up at the windows of the actors' loges in the theater to see if they are illuminated, taking the illumination of the windows as signs of the actors' presence. Muffat's new plan is more experimental than his first, but it is also more consistent with the phantasmagoric quality of the arcade, for the glass and lights of the actors' loges are as lurid as the rest of the arcade, "like the mouths of ovens open over the shadows" (208),⁶³ just another set of lights and windows. The experiment's spectacularity does not contaminate its reliability, however; the experiment proves successful. Not only does Muffat receive support for his hypothesis with the sight of the lights in the windows, but he also finds his results corroborated when Nana later emerges from the theater. Muffat's nervous, mobilized gaze also brings "la vérité" before his eyes when he meets his rival, the actor Fontan, in the arcade. Fontan, like Muffat, wanders the arcade waiting for Nana; whenever the men's paths cross, they exchange a look culminating in a mutual tacit decision to plant themselves in front of the theater door. There they exchange "a glance of fraternal humility, lit [*allumé*] with a trace of defiance over a possible rivalry" (209).⁶⁴ The phantasmagoric arcade and the feeling of "a shame mingled with fear" (208)⁶⁵ that it incites in Muffat force his gaze to wander and, simultaneously, fulfill the promise that "straight" investigation makes but does not keep.

Conversely, when Nana finally emerges from the theater, Muffat returns to his single-minded linear gaze, abandoning all that he has witnessed. But here his original plan fails; "The count, who had prepared questions, found nothing to say. It was she who, in a rapid voice, told a story [*conta une histoire*]" (209).⁶⁶ Muffat finds himself unable to "exact the truth," and thus abandons inquiry altogether, even inquiry into what he has already seen: Fontan. The linear gaze thus develops naturally into a particular kind of spectacular gaze, as Nana lies anew about her whereabouts and her reasons for being in the theater. Moreover, Muffat acquiesces and passively enjoys the performance, not because he is fooled, but because Nana's performance somehow comforts him. "He understood that she was lying. But the warm sensation of her arm [...] left him without strength. He no longer felt either anger nor resentment" (209).⁶⁷ But when Muffat reverts to a gaze fixed on Nana, the result is not the complex, productive spectacle of the phantasmagoria, but the kind of illusionism that is literally falsehood: Nana lies. The contrast between the distracted, mobilized investigations of the arcade and Muffat's passivity before Nana's lies discloses the

limitations of the linear model of investigation that Muffat repeatedly attempts. The “straight” model of scientific investigation, which seeks methodically to reveal the truth beneath an illusionistic surface, always presupposes, and thus can only be satisfied by, an untruth covering over a truth, an illusion that is not productive but literally a lie.

Yet as Nana’s performance indicates, there is pleasure to be had in the discrepancy between the performance and that which one believes to be real. The nature of that pleasure is revealed later in the chapter, when, tipped off by Nana that his wife Sabine may be sleeping with the journalist Fauchery, Muffat wanders Paris in a daze, repeating macroscopically his earlier wanderings in the network of arcades off the boulevard Montmartre. Eventually he finds himself outside Fauchery’s apartment, where he repeats the earlier scene of investigation by staring up at the window for hours, attempting once again to establish some “vérité.” Again Muffat puts his faith in a fixed, intentional linear gaze; “il resta les yeux fixés sur cette raie lumineuse, absorbé, attendant quelque chose” [“he left his eyes fixed on that luminous ray, absorbed, awaiting something”] (224).⁶⁸ Once again, Muffat attempts to enact the epistemic virtue of mechanical objectivity, watching attentively and without fatigue or distraction. As he watches, he fantasizes a linear plan: if he should see the shadow of a woman, he will enter the building, fall upon the lovers in their bed, and strangle them both. The passivity of Muffat’s waiting for “quelque chose” is doubled by the aggressive, if purely mental, activity of his fantasies, as he reproduces the bifurcated active/passive model of the experimentalist who both devises experiments and observes.

Apart from a single interruption by some approaching policemen, in his third scene of investigation, Muffat succeeds in adhering to a linear investigative model aligned with a linear gaze. But this model once again not only fails to exclude spectacle, but also admits precisely the kind of spectacle that fits an illusion/truth depth model. While the image in Fauchery’s window is technologically a literal phantasmagoria, ghostly shadows projected by a lamp onto the scrim of a shaded window, they are also lined up in the path of Muffat’s gaze so that the shadows and the partially open curtains are literal barriers to the reality of what is inside the apartment. The shadows in the windows are optical illusions produced by the bodies of real people, Fauchery and, perhaps, Sabine. They are therefore *simultaneously* a phantasmagoria and evidence of a hidden reality.

The luminous beam still barred the window. This time, he [Muffat] was about to leave, when a shadow passed. It was so rapid that he thought himself mistaken [*il crût s’être trompé*]. But, bit by bit, other blotches ran, and a flurry of agitation took place in the bedroom. He, riveted anew to the sidewalk, experienced a sensation of intolerable burning in the stomach, waiting now to comprehend. Profiles of arms and legs fled; an enormous hand [*main énorme*] traveled with the silhouette of a jug of water. He could distinguish nothing clearly; however he seemed to recognize a woman’s chignon. He discussed it with himself: he would say it was Sabine’s hair, only the neck seemed too thick. At this hour, he

could know no more, do no more [*il ne savait plus, il ne pouvait plus*]. (224-5).⁶⁹

The “main énorme” that appears projected in the window of Fauchery’s room, like the gory “énorme gant” of the arcade windows, invokes the horror of phantasmagoric spectacle. As in the arcade, Muffat experiences acute anxiety, “an intolerable sensation of burning in the stomach.”⁷⁰ But the very anxiety produced by the spectacle is a source of the kind of pleasurable vertigo that, as we have seen, characterizes scientific demonstrations. Muffat’s investigation, his most successfully linear yet, is fraught with conflicting data, above all the belief that his wife is faithful and the shadowy evidence that she is not. The spectacle assures Muffat only of his having been fooled; “il crut s’être trompé.” Yet the *pleasure* of the spectacle’s dissonance comes to be more meaningful than its potential to reveal a definite reality. This is evident when Muffat settles on an infallible test to see whether Sabine is in Fauchery’s room: simply to wait, as he did outside the theater, to see who emerges. But within fifteen minutes, the light in the window goes out, and Muffat suddenly *loses interest*; “this black window, just now, did not interest him any more” (226).⁷¹ After having waited nearly the whole night for Sabine, and only a few minutes after realizing that waiting is the real stratagem that will produce truth, Muffat abandons the scene, and, *as if the two might be interchangeable*, seeks out the earlier spectacle of the passage des Panoramas, which is now closed. Pressing his face against the grille at the arcade’s entrance, “he tried simply to see inside the arcade, seized with an emotion that swelled his whole heart. But he distinguished nothing” (226).⁷² The intense desire “simply to see” discloses how the dissonance of scientific *expérience* is bound up in a process of specular experience—how, as Bernard notes, there is an element of “tâtonnement” or fumbling in the dark that is required, which amounts to “*expériences pour voir*” (Bernard 38). Muffat is not entirely sure he wants to see truth, nor is he fooled by the sight of illusions, but at any rate he wants with all his heart to see.

Muffat’s successive scenes of investigation enact an oscillation between linear and mobilized gazes, which are not affectless and cool like the “impersonnel” naturalist author described in “Du Roman,” but attended by anxiety, pleasure, and desire. These scenes suggest that a naturalist aesthetic of uncovering cannot but entail a vast and terrible drama, not because it fails at the logic of experimental science but because it engages experiential aspects of experimental science that remain relatively unacknowledged by retrospective accounts of scientific mastery. While Muffat repeatedly veers toward the linear model as an investigative ideal, his encounters with the unknown incite phantasmagoric viewing, the mobilized gaze of “distraction,” to use Walter Benjamin’s term.⁷³ If the linear gaze promises demystification, it can only do so by presupposing, and thereby producing, a front/back, illusion/truth economy. Yet that economy is too simple to account for what Muffat finds, for the conviction provided by the linear gaze is above all the conviction that one is viewing falsehood, “il crût s’être trompé,” and it is that unassimilable dissonance that produces the phantasmagoric, *spectacular* pleasure of experiment, just as phantasmagoria in turn produces the possibility of certain kinds of observation. The phantasmagoria of investigation is not the opposite of the linear gaze but its experimental realization.⁷⁴

IV. Regard Circulaire: The Panoramic Gaze

So far in my discussion of the scientific gaze I have confined my attentions to Muffat, the masculine subject-in-crisis who approaches Nana as both spectacle and scientific object. This is not without precedent; by positioning Nana as a social type, Zola invites us to gaze on Nana and to diagnose her, announcing her as infected and infectious, pure unspiritual flesh (*Fabrique* 416, f193).⁷⁵ As Sander Gilman puts it in his study of the stereotypical conflation of female prostitution, disease, and blackness, “What Zola describes is the sexualized woman, the ‘primitive’ hidden beneath the surface”; “Nana’s childlike face is but a mask concealing a disease buried within, the corruption of sexuality” (Gilman 104-5).⁷⁶ However mobilized by phantasmagoric spectacles of light, the scientific gaze is repeatedly proffered in *Nana* as a linear one that might be able to reveal the truth on the *envers*, just as a distracted Muffat will always wrench his eyes away from the salmon in the window in order to fix them again on Nana. In the mind/body, subject/object economy that the experimental gaze always obliquely invokes, Nana is all flesh and all object.⁷⁷

But *Nana* is, after all, a novel about Nana herself, and she, too, has a gaze. As her constant lies, performances, and comforting gestures reveal, the problem with Nana is that she fails to be the completely mastered object that, prior to the nineteenth-century expansion of the human sciences, was the primary domain of science. Indeed, the problem with Nana is the problem with the “human subject” in general: she is liable to perform, to mislead the gaze, or to distract—not so much because she is irretrievably other, as Peter Brooks has suggested, as because she is irretrievably sympathetic, so very human, “bonne fille toujours,” as Zola puts it (*Nana* 422). If nineteenth century science sought to make human beings legible in material terms, Nana, as a *familiar* type, shows how even the most material of human specimens, a woman who “n’est que la chair,” exceeds the bounds of her material existence and her social typology (*Fabrique* 416, f193). Accordingly, a good deal of the novel is given from Nana’s point of view, frequently a literal point of view, a gaze.

But there is no mistaking Nana’s gaze for one of scientific investigation; its first aim is specular pleasure, and, as critic after critic has insisted, the most pleasurable thing on which to gaze is Nana. Nana is both the ideal spectacle and the ideal spectator, not the abjected figure that is excluded from both subject- and object-positions, but rather the impossible occupant of both positions at once. But what I want to highlight here is that Nana’s gaze is “bête,” in a certain way *unseeing*, and ostensibly representative of all that is contemptible about Second Empire spectacular society. Yet Nana’s gaze is also powerful in ways that Muffat’s can never be, and she is likewise sympathetic at moments when Muffat is merely pathetic. If Muffat is the experimental investigator of phantasmagorias, Nana is a panoramic spectator, not fooled by her surroundings but transported all the same.

Nana is, of course, the title character and visual center of the operetta *La Blonde Vénus*, where she appears in the first chapter, and reprises her role in a scene that mirrors

the performance in Chapter 11, at the highly spectacular social event that is the running of a horse race in the Bois de Boulogne. But it is in the center of the novel, in Chapter Seven between Muffat's two phantasmagoric scenes of investigation, that Nana most completely performs her solipsistic self-spectatorship.⁷⁸ As Muffat reads a newspaper article, a thinly-veiled hereditary diagnosis of Nana that she herself does not understand, Nana lights candle after candle, the better to illuminate her own reflection in a mirror, "wishing to see herself better" (*Nana* 215).⁷⁹ Nana's theatrical self-lighting is counterposed against the lights of science. And although Nana is curious about the article, having been told that it describes her, she leaves it to Muffat to dissect, turning her back on it in order to gaze at her own form in the mirror. Muffat is then positioned as a penetrating investigator, moving back and forth between the article, which completely describes Zola's ultimate diagnosis of Nana's role in society and in the Rougon-Macquart lineage, and the sight of Nana herself. As always, Muffat's investigation is marked by the raising of his eyes, juxtaposed against Nana's narcissistic self-spectation: "he raised his eyes. Nana was absorbed in her own self-delight" (*Nana* 216).⁸⁰ What follows is a long description of Nana's amused, childish self-spectation as she moves her neck, pokes at a mole, and balances on one leg or another, always surprised anew at the view of her body moving in the mirror, always "retaken by the vicious curiosities of childhood."⁸¹ Eventually, she begins to caress and kiss herself, "laughing at the other Nana, who likewise kissed herself in the mirror" (217),⁸² involving herself in such total self-pleasure, simultaneously visual and physical, that Muffat, who has been busily engaged in contemplating a scientific explanation of Nana's character and person, becomes exasperated and strikes out violently at her, breaking her gaze.

Nana is the ideally absorbed spectator and the ideally absorbing spectacle, capable of total self-involvement. Unlike Muffat, who always holds out hope for a real to which simulation might point, Nana makes a profession of her simulacral existence. It is for this reason that Nana is "inconsciente," "bête" (*Nana* 217), completely incapable of looking outside the spectacular reality of which she is the center, and therefore incapable of the kind of scientific inquiry into the real that continually occupies, and frustrates, Muffat. "Bête," Nana is too animalistic to bring reason to bear on experience; as Claude Bernard puts it in his *Introduction*, "only man [sic] is capable of acquiring experience [*expérience*] and perfecting himself thereby...*Expérience* is thus the privilege of reason" (Bernard 56).⁸³ But if the fleshly Nana's absorbed self-spectatorship keeps her from self-reflection, it enables the kind of looking, and the kind of seeing, that allows her to become the toast of Paris and rise to its top; whatever she loses in scientific purchase on reality she gains in social success. Whereas the searching Muffat must always raise his eyes to seek out truth, Nana, at the center of the ongoing spectacle of Second Empire Paris, stands in a privileged viewing position of height, the early panoramic viewing position inherited from an eighteenth-century landscape tradition, fallen out of favor among scientists like Bernard but still going strong in the realm of spectacle (Schwartz 151). Nana's view is what T.J. Clark has called "the view from Notre-Dame," in reference to a famous description by Victor Hugo – a

perhaps caricatured view of Paris as “panoramic, unified, theatrical, spectacular, and flat” (Clark 24).

It is perhaps not a surprise that such a position should be demonized as “inconsciente” and “bête” by Zola, who was ever critical of the Second Empire and all that Haussmannization represented. Nana is, after all, presented as a symptom of the Second Empire, and we learn early in the novel that she lives on the boulevard Haussmann itself. Nana’s privileged spectatorship is contingent on her beastly containment by spectacle, a contingency nowhere more evident than in the scene at the horse race, where one of her lovers, Xavier de Vandevres, has named a horse after her. Binoculars in hand, Nana takes in the entire scene, where all of Paris society has gathered; the race, like the première of *La Blonde Vénus*, attracts a crowd “singularly mixed” (*Nana* 39).⁸⁴ Rumors about the horse named Nana run through the crowd as the betting mounts, just as rumors about Nana herself ran through the crowd at the première; when the horses finally come out for the Grand Prix, Nana is the last to emerge, and a gasp goes up:

She had never been seen like this; the gleam of sun gilded the chestnut filly with the blondness of a red-headed girl. She gleamed in the light like a new *louis* [gold coin], the chest deep, the head and neck light, in the fine and nervous throbbing of her long spine.

— Oh! she has my hair! cried Nana, overjoyed. Say, then, you know that I’m proud of it! (*Nana* 349)⁸⁵

The horse Nana and the actress Nana are thereby doubled, and like Nana, the horse is a figure of speculation, an unknown quantity, shiny like money, its popularity depending on rumor and chance. At the height of public curiosity about the horse, at “this final feverish hour,”⁸⁶ Nana becomes an ideal panoramic viewer. “Then Nana, in order to see [*bien voir*], mounted the bench of the landau... With a circular gaze [*regard circulaire*], she embraced the immense horizon” (*Nana* 348).⁸⁷ To “*bien voir*” here is to view the world from above in 360-degree panorama. But while Nana’s “*regard circulaire*” makes her an ideal spectator, it does not remove her from the spectacle; on the contrary, it places her “in the center, lowering her eyes” while she “dominates the plain.”⁸⁸ Nana commands a view of the race from above not unlike those of the original panoramas of the passage des Panoramas, which depicted Paris viewed from the Tuileries and the battle of Toulon, respectively, or indeed, the kind of view offered by *physiologies* and panoramic literature like *Les Français peints par eux-mêmes*. Indeed, Zola’s description of Nana’s gaze as “embrac[ing] the horizon” uncannily echoes the terms of the 1800 commission on the panorama, which described its operation as follows: “Effectively, the panorama is none other than a way of exhibiting a vast painting such that the eye of the spectator, *embracing successively the whole horizon* and encountering the painting everywhere, experiences the most complete illusion” (Buddemeier 165, my emphasis).⁸⁹ The whole racetrack, and all of Paris beyond, is visible to Nana’s “*regard circulaire*,” with Nana “*elle-même*” serving as the axis:

...Nana, who turned slowly about herself, saw at her feet a crowd of beasts and people, a sea of heads beaten and as if transported

around the track by the whirlwind of the race, striping the horizon
with the lively lightning-flash of the jockeys... (351).⁹⁰

If the horse race is ostensibly a spectacle centered on horses, the confusion between the “bête” actress Nana and the beast that Vandeuvres has named after her makes the scene simultaneously a spectacle centered on Nana the actress. Indeed as the race heats up, the conflation of horse and woman becomes more obvious and more extreme, to the point that Nana unconsciously physically mimics the running horse; “without realizing...as if she herself were running. She panted; it seemed to her that it aided the filly” (353).⁹¹ When the horse Nana wins the race, the actress Nana raises her glass of champagne “in apotheosis, the queen Venus in her subjects’ madness,”⁹² repeating her stage role as the triumphant blonde Venus, and when the crowd cheers “Nana! Nana!,” as it once did in the theater, “one no longer knew whether it was the beast or the woman that filled their hearts” (355).⁹³ Thus Nana’s conflatability with a beast both makes her the center of the spectacle, the blonde Venus, and enables her panoramic viewing. Totally contained by and absolutely central to the spectacular reality of Paris society, Nana leads a simulacral existence, not because she exists in a world of immaterial illusion, but because of her total materiality, as an unreasoning being, as one who “is nothing but flesh” (*Fabrique* 416, f193).⁹⁴ Nana’s viewing means that to master the panoramic gaze, to take in that impossible 360-degree view that is not a single perspective but the calculated illusion of *every* perspective, is to be mastered by it. Taking in that immense horizon, Nana does not transcend spectacle but perfects it; to become the supreme viewing subject is to become the supremely viewed object.

Nana’s panoramic gaze is total and totalizing, as Nana takes in all points of view and completes the view with her own body. If Nana possesses the “view from Notre-Dame,” the totalized panoramic image of Haussmannian Paris, it is worth noting Clark’s argument that this spectacle of pleasurable comprehensiveness necessarily “involved some sort of lack—a repression, or alternatively a brazenness.” Moreover, Clark himself names the prostitute as the figure for this total yet somehow paradoxically lacking (“bête?”) view (78). Nana physically embodies what Clark terms “falsity” as a result of her status as a prostitute, inviting by her very social typology male mastery by demystification (111). Zola’s portrait of Muffat complicates the nature of that (rather mythic) demystification, but it is nonetheless one in which Nana cannot participate, a point that Zola puckishly makes when he has Nana toss aside a naturalist novel in disgust. “In the matter of books and drama,” Zola solemnly informs us, “Nana had very settled [*arrêtées*] opinions: she wanted tender and noble works, things to make her dream and enlarge the soul” (318).⁹⁵ Nana is not capable of seeing herself in this “histoire d’une fille,” any more than she is capable of recognizing herself in “La Mouche d’or,” the journalistic parable about her that Muffat reads as she gazes at herself in the mirror. Nana completes the panoramic view with her own body, which is pure flesh, “lack” or “falsity” (as Clark would read it) and inviting of demystification; she can see herself but she cannot penetrate herself. A possessor of neither the linear gaze nor its more experimental double, the phantasmagoric gaze, Nana cannot

demystify herself. Her “inconscience” is the lack in the totalized, panoramic, even simulacral “view from Notre-Dame.”

Yet Muffat is no more capable of the panoramic gaze than Nana is capable of his experimental one; his gaze, ever searching, ever shifting away from its ostensible object and ever veering back, peering up from below and never down from the heights, can never embrace an immense horizon as Nana’s does. Indeed, if Nana is always *simultaneously* a wholly material object of inquiry and a human possessor of the gaze, the proverbial *human subject* of the new sciences and, as a prostitute who spends considerable time evading the authorities, a member of a particularly objectified and racialized population, her gaze resembles the “double-consciousness” described by W.E.B. Du Bois in his *Souls of Black Folk*. Like Du Bois’s black man, she is by virtue of her occupation—which, as medical discourses of the time would have it, was partly determined by her heredity—a “problem.” Indeed, as Gilman has argued, Nana’s “corrupted and corrupting” sexuality places her in a category medically analogous to that of the nineteenth century Hottentot, in spite of the novel’s repeated and almost anxious insistence on the whiteness of her flesh. “The Other’s pathology is revealed in her anatomy, and the black and the prostitute are both bearers of the stigmata of sexual difference and thus pathology,” Gilman writes (107). Made a natural candidate for human subjecthood by the hereditary discourses into which she is born, the racialized and medicalized Nana finally possesses a more *capacious* gaze than does Muffat. Like Du Bois’s black man she is,

born with a veil, and gifted with second-sight in this American world,⁹⁶—a world which yields him no true self-consciousness, but only lets him see himself through the revelation of the other world. It is a peculiar sensation, this double-consciousness, this sense of always looking at one’s self through the eyes of others, of measuring one’s soul by the tape of a world that looks on in amused contempt and pity. (Du Bois 45)

This double consciousness is a kind of *excess* of consciousness, an almost clairvoyant “second-sight”; stunting as it may be, it somehow gives the “problem” the ability to *see more* than the white man is capable of seeing. And yet, as the sociologist Du Bois notes, it “yields him no true self-consciousness.” With a second sight rebounding on itself, the “problem” lacks the linear gaze, and to Du Bois this is an effective castration. To lack a linear gaze is to lack subjectivity.

But this description, while suggestive, cannot entirely account for Nana’s excessive, panoramic “problem” gaze. What is missing from Du Bois’s account is visual pleasure, and this Nana has in abundance, as her panoramic moment at the horse race indicates when we find her “grise de joie” (355). Hers is a joy in performance and a joy in the recognition of her performance, a recognition that she herself gives along with her audience, Nana is what Anne Cheng might call an “incurable performer,” as, no matter how frustrated she is with Muffat, she always eventually reverts to her role of lover and comforter, “bonne fille toujours” (Cheng 47).⁹⁷ And like a later performer in front of a mirror, Linda Low in *Flower Drum Song*, Nana possesses “a transmutable body that can *be* the other, that can

assume numerous points of view, that can make the idealizing image perform for her in turn" (56).⁹⁸ Yet while Nana performs the otherness of race, sex, and class all at once, it is precisely the spectacle of otherness that she does *not* see, instead taking pleasure in vision itself, pleasure in a visual totality of which her own body is the focal point. If her gaze has a lack, it is the inability to see itself as lack, as the illusion or falsehood that the linear gaze constructs in order to demystify. And Nana's gaze is therefore one of pleasurable fullness, plenitude, completion, *underwritten* by "inconscience." The fullest gaze in the novel and the most pleasurable one is Nana's panoramic gaze, precisely the one that delights in a 360-degree, technologically-produced imitation reality. Mastery occurs best inside the panorama.

Indeed, the insufficiency of viewing as a guarantee of the kind of scientific "mastery" of reality, as both Zola and Bernard repeatedly put it, is even more evident in Muffat's investigative viewing, for although Muffat is reflective and ardently seeks the truth about his world, his spectatorship ultimately gives him no more traction with the real than does Nana's. As his phantasmagoric scenes of investigation demonstrate, even a scientific mode of viewing is ultimately also—indeed, often supremely—spectacular, and moreover, this spectacularity is revealed as the condition of experimentalism. In Nana's mirror scene, in which Nana's absorbed self-spectatorship is contrasted with Muffat's scientific viewing, Nana's inability to understand Fauchery's diagnosis of her as a "golden fly," rising from degenerate blood and poisoning all she touches, is effectively no different from Muffat's horrified apprehension of the truth. For even the full clarity of Muffat's realizations about Nana, triggered by the newspaper article and supported by the sight of Nana, "there, before his eyes, in the flesh," does nothing to change Muffat's ultimate course of action. "He was conscious of his own defeat; he knew her to be stupid, filthy, and dishonest, and he wanted her, even poisoned" (*Nana* 217).⁹⁹

Muffat's clear-eyed moment of truth in the middle of the novel is so simultaneously accurate and ineffectual, in fact, that what comes to pass in the novel completely mirrors what he reads in the newspaper article. The novel's final image of Nana triumphant, having fulfilled her biological destiny of destruction, deliberately repeats the language of the description of the newspaper article, describing Nana as a "fly" from the "faubourgs," bringing "decay" and "poison[ing] men simply by alighting on them." She thereby "avenges" the class of "beggars and the abandoned."¹⁰⁰ The key difference in the two descriptions lies in Nana's position; in the middle of the novel, Nana is still counterposed against her description. Her solipsistic gaze is centered on her own body and contained in the bedroom, and is qualified by Muffat's gaze, as he looks from the description in the newspaper to the body in front of the mirror, and back. The later scene, however, is an apotheosis of distinctly panoramic qualities: "Like those monsters of antiquity whose lairs are covered with bones, she placed her feet on skulls, and catastrophes surrounded her" (422).¹⁰¹ In the novel's final image of the prostitute *victrix*, Nana is "surrounded" by the catastrophes that she herself has created, while "in a glory, her sex mounted and radiated over its extended victims, like a rising sun that illuminates a battlefield."¹⁰² Nana *as flesh* simultaneously creates a panorama (a battle scene, historically a favorite subject of the

panorama) and lights it from above “like a sun,” as a literal panorama is lit from above. Nana views and anchors the panorama with her body, effecting total specular mastery. Thus the horror of the panoramic gaze (and its possessor) is finally its power; the “human subject,” a prostitute from the slums who ought to be demystified by science, instead triumphs over the masculine experimental subject, destroying him with her more comprehensive, “double” gaze, made all the stronger and more total because Nana “retains her superb beastly obliviousness.”¹⁰³

If the triumph of the panoramic gaze can on one level be read as a banal critique of Second Empire society as dumbed down, sex-obsessed, and visually dazzled, it also registers a certain anxiety about the possibility of scientific intervention in such a society, in spite of Zola’s more certain-sounding claims, in “Le Roman expérimental,” to eventually “be master of good and evil, to regulate life, to regulate society, in the long run to resolve all the problems of socialism, above all to bring a solid foundation to justice by experimentally resolving questions of criminality” (Becker 177).¹⁰⁴ The experimental enterprise, a naturalism seen as an extension of the sciences, is revealed as vulnerable, unstable, and ultimately complicit with the very spectacular culture that it ostensibly demystifies.

V. The Experimentalist

Can literature be experimental? To answer in the affirmative in the context of the science of his day, Zola had to strenuously repudiate the personal. As Daston and Galison have argued, “the public personas of artist and scientist polarized during [the later nineteenth century]” (*Objectivity* 37). Claude Bernard specifically defined experimental subjectivity in contradistinction to artistic subjectivity, defining the artist as “a man [sic] who realizes in a work of art an idea or a feeling personal to him” (Becker 193).¹⁰⁵ Impersonality, recognizable to us as one of the great modernist pursuits, was defined by Bernard as the *sine qua non* of objectivity, hence of science. Thus in his polemics, Zola insists on impersonality, defining the naturalist author as

he who accepts proved facts, who shows in man and society the mechanism of the phenomena which science has mastered, and who lets his personal sentiments enter in only concerning those phenomena whose determinism is not yet fixed, while he tries to control this personal sentiment, this *a priori* idea, as well as he can by observation and experiment. (Becker 195)¹⁰⁶

Control of the least “sentiment personnel,” even one framed as an experimental hypothesis, is imperative. That control was to be achieved by observation and experiment, the scientific procedures that sought to guarantee purity. Procedure is, according to Daston and Galison, a defining component of late nineteenth century objectivity, one that works directly to counter the “artistic” impulses of the will. “By *mechanical objectivity*,” they write, “we mean the insistent drive to repress the willful intervention of the artist-author, and to put in its stead a set of procedures that would, as it were, move nature to the page through a strict protocol, if not automatically” (*Objectivity* 121). Zola takes the same tack in his

“Roman expérimental,” offering method as a substitute for style. Form is, he recognizes, one of literature’s central concerns, but naturalism as he and Bernard have defined it has nothing to say about form. “[N]aturalism,” Zola writes, “consists uniquely in the experimental method, in observation and experiment applied to literature” (Becker 191).¹⁰⁷ Naturalism is determined by method, not form. Yet naturalism *has* a form, as all literature does, and if pressed, Zola admits to having a theory of form, buried deep like the secrets of nature. “At bottom,” he writes, “it is my opinion that the method reaches to form itself, that language is nothing but logic, a natural and scientific construction” (Becker 192).¹⁰⁸ Confused and tentative as the proposition is, we can see in it the germ of a poetics that would rise in importance in the twentieth century. Method, protocol, and procedure—ways of adhering to epistemic virtues—determine literary form, according to Zola, in a way that anticipates the literary experimentalism of later American authors. In particular, the foregrounding of the epistemic virtue, objectivity, allows Zola to deny any particular form, even as the symmetries and repetitions of his novelistic form disclose the nature of his epistemic investments.

The experimental need for impersonality, and the reliance on a predetermined methodology to produce it, emerges from what Daston and Galison have identified as a particular late nineteenth century conception of the scientific self that is all too ready to intervene, all too ready to impose that which is “merely” subjective on reality, and that therefore requires close policing through established protocols. Yet it is rather more difficult to see how method actually determines form for Zola’s novels. I have read *Nana* so far, not as an enactment of these ideas, but as a comment on them, and certainly Zola’s novels do not undertake the kind of logical formalism suggested near the end of “Le Roman expérimental.” (As we will see, Stein pursues a logical formalism much further than does Zola.) Zola did have a method for writing his novels, and it did involve extensive observations. Behind each novel lies a thick dossier of field notes and sketches. Zola’s dossier for *Nana* includes not only chapter summaries and character sketches but also a detailed sketch of the floor plan of the Théâtre des Variétés and notes on the details of the environment, the Café des Variétés, the horse races at Longchamps, and the observations of Edmond Laporte, Henry Céard, and Ludovic Halévy on the life of the boulevards. Zola’s observations regulate the novels of the *Rougon-Macquart*, which take characters more or less from life and arrange them in similarly observed environments and configurations. We can thus read the dossiers as observational limits on the inventive impulse of the naturalist author, as a method for regulating the personal. The novels unite the observations collected in the dossiers with an active experimental hypothesis, recapitulating the Bernardian model of the split experimental/observational procedure.

Yet as I have argued above, experiment is not as straightforward as it is made out to be, especially when one is making an effort to expand it to new and different objects. My reading of *Nana* is intended to show just how vexed the naturalist engagement with this impersonality necessarily was, not because naturalism failed to be experimental but because it in a sense succeeded. For if essays like “Le Roman expérimental” and “Du Roman” must suppress the affects of experimental inquiry, *Nana* registers how the new sciences’ problem

with the subjectivity of its objects of study was doubled by the problem of the subjectivity of its investigators. Nana is an embodied figure for moral temptation, pleasure, indulgence, before which the putatively “droit” investigator finds himself helpless. Nana’s status as a sexual temptation extends to a visual temptation and hence an epistemological one; the object of science can tempt the investigator into aesthetic pleasure or worse.¹⁰⁹ By literalizing the temptations that beset the scientific investigator as sexual ones contained in the overdetermined body of a prostitute, Zola discloses the investments of mechanical objectivity and simultaneously strives to uphold them. For as the simultaneous object and possessor of a powerful, pleasurable complete, brightly-lit panoramic gaze, Nana shows just how charming are “scientific and aesthetic judgment, dogmatic system-building, and anthropomorphism” enclosed in a simulacral system that, by the lights of mechanical objectivity, defies self-awareness or method. Nana’s is not the aperspectival “view from nowhere,” as Thomas Nagel puts it, but an impossible and heady view from everywhere.¹¹⁰

At the same time, Nana and her ways of viewing are more than just a threat to objectivity, for Nana’s panoramic viewing is only unscientific in the context of late nineteenth century mechanical objectivity and attempts to expand the experimental method to the human sciences. At the time of its introduction in Paris, the panorama was considered a valuable didactic tool and a technological marvel, in part because it adhered to eighteenth-century values of scientific representation that emphasized the judgment of the artist over the mechanical reproduction of nature.¹¹¹ When the panorama was first introduced, its illusionism was the *condition* of its scientificity. The new science saw this kind of viewing as monstrously subjective; in *Nana*, that “bête” inability to be objective is attributed to the prostitute who is newly a scientific object.¹¹² But it should give us pause that the temptations of subjectivity are figured as sexual here, for passivity in the face of sexual temptation is a danger not of late nineteenth century mechanical objectivity but of the eighteenth century scientific mode that Daston and Galison term “truth-to-nature.” Truth-to-nature emphasized the use of judgment to pick out the essentials of nature from its particular and merely contingent aspects. “Reason might succumb to the blandishments of the imagination, that ‘coquette’ who aimed primarily at pleasure, rather than at truth,” Daston and Galison write. “Imagination could substitute fanciful but alluring systems for genuine impressions derived from memory and sensation. Vanity seduced natural philosophers into abandoning reality for systems wrought by their own imaginations” (*Objectivity* 224). The gendered and sexualized figuration of imagination and vanity is unmistakable. But Nana is not the plump female allegorical figure of Imagination (*Objectivity* 226). In the context of the new sciences, far from distracting from reality, Nana is reality, overdeterminedly an object of study. Spectacle, distraction, and the sexualized woman who embodies spectacle all produce passivity, but when science is reconfigured as a policing of the scientific will, passivity is precisely what is required. Thus the competing visual registers in *Nana* stage a dangerous complicity between knowledge as such and the “bête,” between subject and object, between science and entertainment.

In his historical study of vision, *Techniques of the Observer*, Jonathan Crary argues for a distinction between the terms *spectator* and *observer*, the former literally meaning one who

looks and connoting passivity, the latter meaning “to conform one’s action, to comply with.” The choice is persuasively polemical; the term *observer* is meant to imply not merely one who sees, but “one who sees within a prescribed set of possibilities, one who is embedded in a system of conventions and limitations,” perhaps in a purposeful way, as, indeed, the scientific connotation of *observation* suggests (6). Yet the economy of vision in *Nana* suggests that perhaps it is the passive, potentially even mindless quality of the spectator that is raised as a specter for experimental science (pun intended), not because it obstructs science but because it has troublingly come to be that which enables it. If, in other words, to *observe* entails compliance with a system of limitations, in the context of science those limitations specifically demand the kind of suppression of subjectivity that produces objectivity, a state perhaps best achieved in the self-abnegation of passive spectatorship. Zola’s experimental writing constitutes the distinction between observer and spectator by the unsettling way in which the latter produces the former. The affects of phantasmagoric investigation—anxiety, fear, vertigo—which are imposed from above render the spectator receptive to the experiences of the senses in a way that *enables* mechanical objectivity, in contradiction to the supposition—Muffat’s included—that mechanical objectivity is just what the human failings of distraction and pleasure-seeking undercut. Indeed, the spectatorship of phantasmagoria seems to succeed in mechanizing perception and negating self-presence far more thoroughly than the most heroic scientific self-restraint could do. Thus the novel suggests a doubling back of the investigative process. For as we saw in Muffat’s initial venture backstage, anxiety and vertigo are produced by a spectacle of *science*, the spectacle of demystification typified in eighteenth- and nineteenth-century scientific demonstrations. Such spectacularity was confirmed by the slippage between “demonstration” as proof and “demonstration” as show. That science could produce truth where the senses were fallible was the source of both anxious vertigo and pleasure. What science had already established, the “connu,” produced the non-verisimilitude of reality, in the form of technological marvels. Thus in *Nana*, science-as-spectacle engenders both anxiety and specular pleasure, which in turn produces non-self-presence. Non-self-presence is in its turn the precondition for a kind of mechanized objectivity that is supposed to make science possible. Thus science takes on a kind of self-purifying autonomy, itself projecting the phantasmagorias that underwrite the possibility of perceiving “la vérité.”

When Zola argued for an experimental novel, he did not do so on the assumption that experimental science was ahistorical, monolithic, and outside culture. On the contrary, it was his understanding of science as historical and existing in dialectic with mass spectacle that made an experimental novel possible. If Zola’s naturalism is an odd outlier, fitting comfortably neither in narratives of nineteenth century realism nor in narratives of those other literatures of the future, self-described as “avant-garde” or “modernist,” it was nonetheless wildly popular, as spectacular as the culture in which it emerged, a “vast and terrible drama” that specifically engaged the problems of a changing scientific culture. New subjects of science met with new objects of science on the grounds of public entertainment, the newspaper *feuilleton*—the same *feuilleton* that might offer Muffat a full account of *Nana* in the terms of the most up-to-date popular science of the day.¹¹³ In negotiating

experimental science, Zola set the terms for literary experiment – an understanding of experiment rooted less in specific procedures than in epistemic virtues, a desire to subordinate style to knowledge, and a strong awareness of the complexities involved in any experimentalism that takes human beings for its objects of study.¹¹⁴

The concerns that Zola takes up are recognizable as concerns that, as I will elaborate, also preoccupy later experimental writers, among whom I take Gertrude Stein, Marianne Moore, and William Carlos Williams to be prime examples. “Le Roman expérimental” reveals how those concerns participate in a discourse of authority; *Nana* reveals how they are concerns not only of “objectivity,” method, and form, but also of ethics, affect, and pleasure. Zola’s naturalism attempted to negotiate the radical shifts in the “sense of the real” that science, in partnership with mass culture, occasioned. That Zola himself wrote as a participant in mass culture is entirely consistent with the enterprise. Although I would not go so far as to argue lines of direct influence from Zola to all the later writers who have been labeled “experimental,” it is clear that Zola was one of the earliest and most important theorists of the *particular* notions of experimental science that would be taken up in the twentieth century. I do not simply mean that Zola found a particular mode of experimental science interesting and the modernists did too. Rather, I would argue that experimental literature’s realization in naturalism fixes upon a particular way in which experimental science had become intellectually available, through the epistemic virtues that they entailed (in this case, the virtue of mechanical objectivity). Zola’s naturalism engages with an experimental science that was both epistemologically powerful and spectacular; by reading later experimentalists through that naturalism, we can see how experimental literature acts as (to alter Tom Gunning’s phrase) a “literature of attractions,” in which the attraction is the marvelousness of science itself. But in order to see the transition from the naturalist novel to American experimental modernism, we must turn to “the first definite step away from the nineteenth century and into the twentieth century in literature,” as Gertrude Stein would later call her 1909 work “Melanctha” (Stein 54).

Notes to Chapter Two

¹ “Esprit un peu lourd, mais droit” (*Fabrique* 412, f188). Translations from the dossier are my own.

² As Zola writes in the *dossier*, Muffat and his wife only have a worldly existence as part of Muffat’s job, “à cause de sa [Muffat’s] situation à la cour” (*Fabrique* 412, f189).

³ Not only is the Exposition Universelle the primary reason for the prince’s presence in France; various conversations in the novel (at Sabine’s party, and later at Nana’s) emphasize this fact. At a dinner party at Nana’s house, discussion of the Exposition supplies the occasion for all the prostitutes assembled there to dream of all the rich foreigners who might come to Paris and pay them a fortune for one night’s work; the prince is specifically mentioned (*Nana* 119).

⁴ Translations of “Le Roman expérimental” are taken from the unattributed translation in George J. Becker, ed., *Documents of Modern Literary Realism* (Princeton: Princeton UP: 1963).

⁵ “Muffat surtout, qui n’avait jamais visité les coulisses d’un théâtre, s’étonnait, pris d’un malaise, d’une répugnance vague mêlée de peur” (*Nana* 149). I give my own more literal translations in the text above, but supply Douglas Parmée’s translations for the *Oxford World’s Classics* series in the notes. “Muffat had never been backstage in a theatre and was feeling particularly surprised and uneasy, full of vague repugnance not unmixed with fear” (Parmée 120).

⁶ “...une vie souterraine, avec des profondeurs d’obscurité, des voix d’hommes, des souffles de cave” (*Nana* 149). Parmée translates: “an underground world like a cellar, full of deep shadows, draughts, and voices.”

⁷ Although my reading is necessarily informed by psychoanalysis, my use of the word “gaze” here carries more Foucauldian connotations. In this chapter I will implicitly argue that for Zola, modes of looking metonymize and in part determine modes of knowing.

⁸ Indeed, Henri Mitterand argues that Zola was effectively naturalism’s *only* outspoken proponent, since the other writers associated with the school were willing to theorize it only rarely, and usually at Zola’s behest (Mitterand 56). Although I use the term “school” here as a shorthand for the cluster of authors variously identified with naturalism, Zola himself disavowed the term, arguing that naturalism was simply the application of the experimental method to literature, a natural progression of the age, owing nothing to himself. For Zola, the idea of a literary “school” depended on a notion of Romantic genius that he rejected (*Roman* 42-3).

⁹ “Enfin, il visitera les lieux, vivra quelques jours dans un théâtre pour en connaître les moindres recoins” (*Roman* 208). Translations of “Du Roman” are my own.

¹⁰ In “Zola as a Romantic Writer” (1886), Norris at first sets up a schema in which Romanticism is opposed to realism, with Zola firmly in the Romantic camp on account of his novels’ dramatic logic. Later in the essay, Norris argues for the distinctiveness of naturalism as a third term, though he continues to ally it with Romanticism.

¹¹ I will use the term “naturalist” in this chapter to refer to practitioners of literary naturalism. In Chapter Four, which discusses the discipline of natural history, “naturalist” will refer to zoologists, botanists, and other practitioners of natural history.

¹² “constellations de petites étoiles bleuâtres, dans le chaos du gril et des fils de toutes grosseurs, des ponts volants, des toiles de fond étalées en l’air, comme d’immenses linges qui séchaient” (*Nana* 148-9). Parmée: “constellations of tiny bluish stars amid the wild confusion of the grid, with its cables of every possible thickness, flying bridges, and backcloths floating in the air like huge sheets of linen hung up to dry” (120).

¹³ “...les progrès de la science appliquée au théâtre moderne” (Moynet 128).

¹⁴ “Ce qu’on appelle l’état d’une science, à un moment donné, n’existe que par choix” (Serres 30). Translations of Serres are my own.

¹⁵ Zola's naturalism is by no means the first application of the idea of scientific progress to the arts; one can see it, for instance, in the report of the 1800 commission on the panorama (see the appendix in Buddemeier). It is worth noting in this example, however, that the kind of progress attributed to the arts is a kind of secondary one, derivative of progress in the sciences. Zola's polemics take a similar tone at times, but they also explicitly seek to elevate the novel to a science (and there is no question that such a move would indeed be an elevation for Zola).

¹⁶ Mitterand argues that although Zola had earlier invoked a scientific rhetoric based on the analogic arguments of critics like Hippolyte Taine and Émile Deschanel, Zola's new and stronger polemics stemmed more from reading works by Prosper Lucas and Claude Bernard—the latter, of course, being amply represented in “Le Roman expérimental.” (51).

¹⁷ “Notre but est le leur; nous voulons, nous aussi être les maîtres des phénomènes des éléments intellectuels et personnels, pour pouvoir les diriger” (*Roman* 23-4).

¹⁸ “S’il fallait donner une comparaison qui exprimât mon sentiment sur la science de la vie, je dirais que c’est un salon superbe tout resplendissant de lumière, dans lequel on ne peut parvenir qu’en passant par une longue et affreuse cuisine.”

¹⁹ “Par la seule marche naturelle de son évolution,” he writes, “elle [la médecine] abandonne peu à peu la région des systèmes pour revêtir de plus en plus la forme analytique, et rentrer ainsi graduellement dans la méthode d’investigation commune aux sciences expérimentales” (Bernard 6). Translations of Bernard are my own.

²⁰ “Par la seule marche naturelle de son évolution, elle [la médecine] abandonne peu à peu la région des systèmes pour revêtir de plus en plus la forme analytique, et rentrer ainsi graduellement dans la méthode d’investigation commune aux sciences expérimentales.”

²¹ “Puisque la médecine, qui était un art, devient une science, pourquoi la littérature elle-même ne deviendrait-elle pas une science, grâce à la méthode scientifique?” (*Roman* 30)

²² Wilhelm Wundt's experimental psychology laboratory, the first of its kind, was established in Leipzig in 1879, the year in which “Le Roman expérimental” first appeared.

²³ “Je vais tâcher de prouver à mon tour que, si la méthode expérimentale conduit à la connaissance de la vie physique, elle doit conduire aussi à la connaissance de la vie passionnelle et intellectuelle. Ce n’est là qu’une question de degrés dans la même voie, de la chimie à la physiologie, puis de la physiologie à l’anthropologie et à la sociologie. Le roman expérimental est au bout” (*Roman* 2).

²⁴ “obéir l’évolution générale du siècle” (*Roman* 32).

²⁵ Ian Hacking implicitly upholds the opposition between observation and experiment in evaluating their consequences for the philosophy of science in *Representing and Intervening*. Representation, Hacking argues, is a red herring; we understand the reality of scientific concepts better by way of their roles in experiments than by the way in which they represent.

²⁶ Bernard's scientist is masculine by definition, as is Zola's; I will always refer to scientists with masculine pronouns in this chapter. This gendered paradigm is challenged in Stein's work, as we will see in the next chapter.

²⁷ "Nous donnerons au mot *expérience*, en médecine expérimentale, le même sens général qu'il conserve partout. Le savant s'instruit chaque jour par l'expérience ; par elle il corrige incessamment ses idées scientifiques, ses théories, les rectifie pour les mettre en harmonie avec un nombre de faits de plus en plus grands, et pour approcher ainsi de plus en plus la vérité."

²⁸ Mimicking Bernard's disclaimer (Bernard 9), Zola writes, "Je n'aurai à faire ici qu'un travail d'adaptation, car la méthode expérimentale a été établie avec une force et une clarté merveilleuses par Claude Bernard, dans son *Introduction à l'étude de la médecine expérimentale*. Ce livre, d'un savant dont l'autorité est décisive, va me servir de base solide" (*Roman* 1).

²⁹ "Derrière une science, derrière une manifestation quelconque de l'intelligence humaine, il y a toujours, quoi qu'en dise Claude Bernard, un système philosophique plus ou moins net" (*Roman* 45).

³⁰ L'expérimentateur doit alors disparaître ou plutôt se transformer instantanément en observateur ; et ce n'est qu'après qu'il aura constaté les résultats de l'expérience absolument comme ceux d'une observation ordinaire, que son esprit reviendra pour raisonner, comparer et juger si l'hypothèse expérimentale est vérifiée ou infirmée par ces mêmes résultats. (Bernard 41)

³¹ "L'observateur doit être le photographe des phénomènes, son observation doit représenter exactement la nature. Il faut observer sans idée préconçue ; l'esprit de l'observateur doit être passif, c'est-à-dire se taire ; il écoute la nature et écrit sous sa dictée" (39-40).

³² "aucune idée scientifique" (Bernard 43).

³³ "Huber était donc l'esprit directeur qui instituait l'expérience ; mais il était obligé d'emprunter les sens d'un autre. Le domestique représentait les sens passifs qui obéissent à l'intelligence pour réaliser l'expérience instituée en vue d'une idée préconçue" (43).

³⁴ In their study *Objectivity*, Daston and Galison point out that Bernard's understanding of François Burnens's role in Huber's work was "revealingly distorted." Burnens, Huber's servant, was not a passive tool but Huber's reader, and thus a learned and experienced naturalist whom Huber himself acknowledged as such. "Far from enlisting the 'passive senses' of an ignorant servant," Daston and Galison write, "Huber trusted Burnens's eyes because his domestic had been trained as an active observer in the truth-to-nature style. Bernard's utter misunderstanding of Burnens's role measures the distance between divergent ideals of scientific passivity and its optimal distribution" (*Objectivity* 96).

³⁵ "suivant les diverses hypothèses qui lui sont suggérées" (Bernard 40).

³⁶ "sentiment personnel...reste soumis au contrôle de la vérité" (*Roman* 49).

³⁷ I do not wish to gloss over the distinction between the demonstrations within scientific societies and broader public demonstrations. Yet as Steven Shapin and Simon

Schaffer showed in their classic study of early modern British chemistry, *Leviathan and the Air-Pump*, the question of who counted as a “witness” to an experiment, and whether witnessing by a larger audience or a more select one ought to count as more reliable verification was far from a settled matter in the seventeenth century and remained contestable through the nineteenth century. It is not that there is no distinction between private and public demonstrations but that it was only with the consolidation of professional science that one came to be seen as clearly epistemically superior to the other.

³⁸ On the history of the Royal Polytechnic Institution, see Weeden.

³⁹ Considerable work has been done on the relationship between scientific experiment and public demonstrations in Victorian England; see for instance Secord.

⁴⁰ For a classic discussion of the role of technological wonders in early cinema per se, see Tom Gunning, “The Cinema of Attraction.”

⁴¹ It will be noted that both the phantasmagoria and the panorama originate in the late eighteenth century, over eighty years before the publication of *Nana*, which in turn was published prior to the shift in panoramic aesthetics that Schwartz identifies with the 1880s. I would argue that the late eighteenth century aesthetics of the panorama are precisely the point for Zola, as the panorama represents a mode of looking that in the later nineteenth century would be considered unethically subjective. The phantasmagoria, in contrast, is easily transposed onto features of the city specific to the later nineteenth century, as Walter Benjamin shows. Benjamin is interested primarily in the illusionism of the phantasmagoria, but Zola, I argue, sees that illusionism as productive.

⁴² For a description of the phantasmagoria and related visual spectacles, see Marina Warner’s *Phantasmagoria*, especially chapter eleven, “Darkness Visible: The Phantasmagoria.” Terry Castle argues in her usefully descriptive chapter “Phantasmagoria and the Metaphorics of Modern Reverie” that as the phantasmagoria slipped into wider usage as a metaphor for thought, the rationalist domestication of ghosts as mental fabrications had the effect of making thoughts themselves seem ghostly and externally imposed. Castle thus roots a romantic discourse of being “haunted” by thought in a modern rationalist project. Although Castle’s focus is different from mine, her argument points up the phantasmagoria’s illusionism, its production of false specters that are nonetheless perceived as real and externally imposed. See Castle, *The Female Thermometer: Eighteenth-Century Culture and the Invention of the Uncanny* (New York: Oxford UP, 1995), chapter 9. Margaret Cohen’s article “Walter Benjamin’s Phantasmagoria” discusses the historical phenomenon of the phantasmagoria in relation to Benjamin’s use of the term.

⁴³ “La Salle où se réunit le public, en attendant les expériences de la *Fantasmagorie*, offre tous les prestiges de l’Optique imaginés jusqu’à présent pour tromper les yeux” (Warner 152). My own translation.

⁴⁴ “EXPÉRIENCES sur le fluide Galvanique dont l’application rend non seulement le mouvement, mais encore les habitudes aux corps privés de la vie depuis plusieurs jours” (Warner 152).

⁴⁵ See for example Marina Warner's *Phantasmagoria*, Anne Friedberg's *Window Shopping*, and G.-M. Coissac, *Histoire du Cinématographe* (Paris, Éditions du 'Cineopse,' 1925). Curiously, Jonathan Crary alludes to the phantasmagoria in *Techniques of the Observer* not as a visual spectacle in its own right but as a metonym for a general illusionistic impulse, and in particular the hiding of machinery (*Techniques* 132).

⁴⁶ Anne Friedberg has pointed out that the English rendering of *passage* as "arcade" erases the structure's role in pedestrian circulation; nonetheless, I use "arcade" here for the sake of clarity (Friedberg 49).

⁴⁷ On the panorama see Benjamin, Buddemeier, Crary, Friedman, A. Miller, Oettermann, and Schwartz.

⁴⁸ On the panorama as a substitute for travel, see Griffiths, " 'Journeys for Those Who Can Not Travel.' "

⁴⁹ See especially Benjamin's 1929 essay "Der Saturnring oder Etwas von Eisenbau" ("The Saturnring or Something about Iron Construction"), in *The Arcades Project*.

⁵⁰ "choisir une éminence assez élevée pour qu'il puisse découvrir tous les points de l'horizon et appercevoir en même tems les détails qui se trouvent au pied de l'élévation sur laquelle il est placé" (Buddemeier 166). My own translation. Note the repeated insistence on the height from which the painter must observe the scene.

⁵¹ "sous un aspect avantageux et dans la position la plus propre à rendre leur effect piquant ... afin de donner une juste idée et la Phisionomie, pour ainsi dire, de la contrée qu'il veut représenter."

⁵² See also Daston and Galison, "The Image of Objectivity." Describing scientific images in the late nineteenth century mode of objectivity that they call "mechanical," Daston and Galison observe that "Accuracy had to be sacrificed on the altar of objectivity" (114). No popular entertainment, it seems to me, better demonstrates the way that public amusements intentionally trigger the sublime than the roller-coaster.

⁵³ "[F]orce la nature à se dévoiler, en l'attaquant" (Bernard 41). *L'Envers du théâtre* is the title of Jean-Pierre Moynet's book on stage décor and stage illusionism. Like the initial description of Muffat entering the wings of the theater, the title (and in some measure the book itself) emphasizes the front/back economy of discovery popularly associated with science. Indeed, it was published as part of Hachette's *Bibliothèque des Merveilles* (*Library of Marvels*), a popular science series that ran from the early 1860s to the early 1890s. Science in this particular popularization is represented as a cabinet of marvels, and the discovery of the back of the theater fits in with this logic of depth as well as do titles like *Le Fond de la mer* (*The Bottom of the Sea*, Leon Sonrel, 1868), *Les Merveilles du monde invisible* (*The Marvels of the Invisible World*, Wilfrid de Fonvielle, 1867), and *Les Villes retrouvées* (*Recovered Cities*, Gabriel Hanotaux, 1881).

⁵⁴ For a psychoanalytic reading of the unveiling of Nana, see Peter Brooks's essay "Storied Bodies, or Nana at Last Unveil'd." Working from the context of the late nineteenth century nude in painting, Brooks reads Nana as constitutively veiled by difference.

⁵⁵ “doit être passif, c’est-à-dire se taire ; il écoute la nature et écrit sous sa dictée” (Bernard 40).

⁵⁶ In his *Arcades Project*, Benjamin writes that the boulevards create “phantasmagorias of space to which the flâneur devotes himself” (12). For Zola, such phantasmagorias are literalized as optical effects.

⁵⁷ “Nana allait sortir, il exigerait la vérité” (*Nana* 206). Parmée: “Nana would be coming out, he’d demand to know the truth” (181). The construction of the phrase suggests for a moment an apposition—that to extract Nana from the theater is to extract the truth. As I will discuss in the next section, the novel always plays with the idea of Nana as pure object, which suggests that to fix Nana’s body is to master her. But this possibility is refused over and over again, as Nana stubbornly continues to have her own feelings and desires—subjectivity, in short.

⁵⁸ “C’était, sous les vitres blanchies de reflets, un violent éclairage, une coulée de clartés, des globes blancs, des lanternes rouges, des transparents bleus, des rampes de gaz, des montres et des éventails géants en traits de flamme, brûlant en l’air; et le bariolage des étalages, l’or des bijoutiers, les cristaux des confiseurs, les soies claires des modistes, flambaient, derrière la pureté des glaces, dans le coup de lumière crue des réflecteurs; tandis que, parmi la débandade peinturlurée des enseignes, un énorme gant de pourpre, au loin, semblait une main saignante, coupée et attaché par une manchette jaune” (*Nana* 205). Parmée: “The glass roof was gleaming with bright reflections and the passage was ablaze with light from the white globes, the red lamps, the blue transparencies, and banks of flaring gas-jets depicting giant watches and fans flickering in the air; and behind the clear plate-glass shop-windows, the gaudy displays, the gold of the jewellers, the crystal ware of the confectioners were all glittering in the glare of the reflectors; amidst the motley collection of garish shop-signs, a huge purple glove seemed from afar like a bleeding severed hand held on by a yellow cuff” (179).

⁵⁹ Muffat’s evening in the passage des Panoramas reads like a Benjaminian set-piece explaining the distortions produced by the commodity, for the optical illusions produced by the technologies of plate-glass and gaslight are, simultaneously, the effects of the displayed objects’ positioning as commodities. Curiously, Benjamin mentions only Zola’s very early *Thérèse Raquin* (1867) and his very late *Travail* (1901) in his *Arcades Project*; the twenty-volume *Rougon-Macquart* cycle that filled the interim is ignored. Buse et al. speculate that Zola was too “obvious” a source for Benjamin (Buse et al. 16).

⁶⁰ This is, of course, precisely the kind of arcade in which Benjamin is interested. Zola’s early novel *Thérèse Raquin* is set in a similarly sordid arcade; Walter Benjamin wrote of the novel in *The Arcades Project*, “If this book really expounds something scientifically, then it’s the death of the Paris arcades, the decay of a type of architecture” (*Arcades* H1, 3).

⁶¹ See Friedberg’s *Window Shopping: Cinema and the Postmodern*, especially her discussion of the mobilized gaze in the arcade (68-81). For Friedberg, the panorama, diorama, and phantasmagoria provide a model of a “virtual” gaze, in which the viewer “enjoyed the illusion of presence of virtual figures,” as well as a “mobilized” gaze related to

flânerie (23). Like Jonathan Crary in *Techniques of the Observer*, Friedberg tends to lump together precinematic displays that conceal their apparatuses.

⁶² “...comme s’il les voyait pour la première fois” (207). Parmée: “as though he were seeing them for the first time” (181).

⁶³ “...comme des gueules de four ouvertes sur les ténèbres” (208). Parmée: “...giving the impression, all the way up this sort of pit-face, of oven-doors opening out on to the gloom” (182).

⁶⁴ “un regard d’humilité fraternelle, allumé d’un restant de défiance sur une rivalité possible” (209). Parmée: “a brotherly look of humiliation, with a glint of lingering distrust as to possible rivalry” (183).

⁶⁵ “une honte mêlée de peur” (*Nana* 208).

⁶⁶ “Le comte, qui avait préparé des questions, ne trouvait rien à dire. Ce fut elle qui, d’une voix rapide, conta une histoire” (*Nana* 209). Parmée: “The count had planned what to ask her but was unable to find anything to say. It was left to her to quickly blurt out her story” (183).

⁶⁷ “Il comprit qu’elle mentait. Mais la sensation tiède de son bras ... le laissait sans force. Il n’avait plus ni colère ni rancune” (*Nana* 209). Parmée: “He saw she was lying. But the warmth of her arm pressing heavily on his own left him weak and defenceless. He no longer felt angry or resentful...” (184).

⁶⁸ Parmée: “He stood there absorbed, staring up at this beam of light, waiting” (200).

⁶⁹ “La raie lumineuse barrait toujours la fenêtre. Cette fois, il [Muffat] allait partir, quand une ombre passa. Ce fut si rapide, qu’il crut s’être trompé. Mais, coup sur coup, d’autres taches coururent, toute une agitation eut lieu dans la chambre. Lui, cloué de nouveau sur le trottoir, éprouvait une sensation intolérable de brûlure à l’estomac, attendant pour comprendre, maintenant. Des profils de bras et de jambes fuyaient; une main énorme voyageait avec une silhouette de pot à eau. Il ne distinguait rien nettement; pourtant il lui semblait reconnaître un chignon de femme. Et il discuta: on aurait dit la coiffure de Sabine, seulement la nuque paraissait trop forte. A cette heure, il ne savait plus, il ne pouvait plus” (224-5). Parmée: “The shaft of light was still shining through the window. This time he was just about to go away when he saw a shadow. It happened so quickly that he thought he’d been mistaken. But then there was a quick succession of dark patches; the whole bedroom sprang into restless activity. Once again he was riveted to the spot, this time with an agonizing cramp in his stomach as he tried to figure out what was happening. There was a flurry of shadowy arms and legs; a huge hand moved across, holding the silhouette of a jug. He couldn’t make anything out clearly, although he thought he recognized a woman’s chignon. He debated with himself: it was somewhat like Sabine’s hair-style but the back of her neck was too thick. He felt incapable of thinking or doing anything” (201).

⁷⁰ “une sensation intolérable de brûlure à l’estomac.”

⁷¹ “cette fenêtre noire, à présent, ne l’intéressait plus” (*Nana* 226). Parmée: “now this dark window had ceased to interest him.”

⁷² “il tâchait simplement de voir dans le passage, pris d’une émotion dont tout son coeur était gonflé. Mais il ne distinguait rien” (*Nana* 226). Parmée: “He wasn’t shaking [the bars of the arcade], merely trying to look into the arcade, his heart suddenly full of emotion. But he couldn’t distinguish anything” (203).

⁷³ In *Suspensions of Perception*, Jonathan Crary has incisively critiqued Benjamin’s view that the rise of capitalism in the nineteenth century created an environment of distraction. Crary argues that if the later nineteenth century was marked by distraction, it is only because it was attended by a proliferation of technologies of *attention*, a phenomenon that always borders perilously on distraction. See Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge: MIT Press, 1999), especially pp. 49-51. What interests me here is the way in which distraction and attention mutually construct pleasure on the site of investigation.

⁷⁴ Muffat’s experience is, of course, not only specifically phantasmagoric but generally uncanny, to use the Freudian term. In Freud’s words, the uncanny emerges when “infantile complexes which have been repressed are once more revived by some impression, or when primitive beliefs which have been surmounted seem once more to be confirmed” (XVII 249). In light of the ideologies of science and modernity that tended to map infancy onto pre-modernity and certain geographical territories, it is easy to read childhood as a pre-modern, pre-scientific state, such that “primitive beliefs” might as well mean the unscientific in general as childish fears in particular. Thus the phantasmagoria produces phantasms that corroborate pre-scientific fears (i.e. of ghosts) rather than scientific explanations (ghosts are psychological projections). Terry Castle further argues that the uncanny is engendered by a return-to-view, “paradoxically, after a certain *light* has been cast” (7). Castle suggestively reads the uncanny as a product of Enlightenment rationalism, with all the overdetermined valences of “light” that it entailed. It is tempting to extend this moment further, to see Muffat’s phantasmagoria of investigation as a play of light that unearths the “secretly familiar.” I would argue, however (and quite apart from my resistance to a thoroughly psychoanalytic reading), that Zola is more interested in the way that investigation produces unassimilable contradictions between the sensory and the “real,” which in turn produces problematic affective states for the scientific investigator. See Sigmund Freud, “The ‘Uncanny,’” in *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, ed. and trans. James Strachey (London: Hogarth, 1955) and Castle, *The Female Thermometer*.

⁷⁵ As Henri Mitterand notes, *Nana* is a social type belonging to a diagnostic genre that Walter Benjamin called “panoramic literature” (Mitterand 22). For discussion of the panoramic literature and a related genre, the *physiologie*, see Margaret Cohen, “Panoramic Literature and the Invention of Everyday Genres,” and Priscilla Parkhurst Ferguson, *Paris as Revolution: Writing the Nineteenth-Century City* (Berkeley: U of California P, 1994), especially chapter three.

⁷⁶ Although Gilman makes a strong case for his argument that “the black servant is hidden in *Nana* [...] within *Nana*” (102), particularly in reference to the Manet painting *Nana*, he misses the literal servant in *Nana*, *Nana*’s maid Zoé, whose description telegraphs stereotypical blackness like an 1850s American passing narrative: “Zoé, très brune, coiffée de petits bandeaux, avait une figure longue, en museau de chien, livide et couturée, avec un nez épaté, de grosses lèvres et des yeux noirs sans cesse de mouvement” (60). Zoé offers a fascinating counterpoint to the stereotypical black servant that Gilman discusses as “signal[ing] the hidden sexuality of the white woman” (83); she manages both *Nana* and *Nana*’s customers with businesslike efficiency, and at the end of the novel succeeds the ubiquitous Parisian procurer la Tricon as madam to the stars. A consummate player of the game, rather than resist the traffic in bodies, Zoé masters it; she is not the trafficked but—chillingly, we are to understand—the trafficker. Zoé’s ascendancy doubles *Nana*’s, and inspires the same kind of horror—that of the commodified woman invested with power.

⁷⁷ There have been several useful analyses of the construction of woman an object of science, frequently conceived simultaneously as the object of a gaze. See in particular Evelyn Fox Keller’s classic essay “Gender and Science,” in *Discovering Reality*. Michèle Le Doeuff offers a critique of Keller’s assessment of Baconian metaphysics in *The Sex of Knowing*, arguing that Bacon’s metaphysics is theoretically separable from his sexism, the latter belonging to what she describes as a hollow affective apparatus arbitrarily associated with reason by men in power. In my reading, however, the two scholars agree in substance, i.e. that the object of science is typically perceived as feminine, and that it need not be. Le Doeuff’s concern is that Keller’s reading may work to uphold what she argues is a mistaken assumption that knowledge is by definition masculine; she supplements her critique of Keller with an entire chapter (chapter two) devoted primarily to showing how discourses of knowledge systematically exclude women and represent them as objects about which anything may be said — in contrast with natural objects, about which, Le Doeuff observes, science has at least attempted to assemble facts. For Le Doeuff, it is not that science is masculine *per se* but that men have historically included science in the long list of forms of knowledge to which women must not have access.

In her essay “Experimenting on Women: Zola’s Theory and Practice of the Experimental Novel,” Dorothy Kelly draws on Keller in another way, holding up Zola’s “Roman expérimental” as an instantiation of the masculinist ideology of science that Keller saw in Bacon. Kelly reads “Le Roman expérimental” against two novels of the *Rougon-Macquart* cycle, *La Faute de l’abbé Mouret* and *Le Docteur Pascal*. One can see why Kelly would choose these two novels, as the choice allows her to puckishly compare a priest and a scientist as two keepers of masculine purity. But as Kelly herself notes (233), *La Faute de l’abbé Mouret* is early (1875) and *Le Docteur Pascal* (1893) is the last novel in the twenty-volume cycle, neither of them especially close to the second emergence of Zola’s theory of the experimental novel (1879-80). Kelly’s analysis, though relevant to the present study, is curiously one-sided. Although, at the end of the essay, she acknowledges the glaring fact that Clotilde survives *Le Docteur Pascale* as a figure of hope rather than a “contamination,”

it is not a fact her argument can easily accommodate. While Kelly makes the valuable point that Zola considers femininity antithetical to science (and surely *Nana* is a prime example of this position), the argument seems to be animated by a reductive battle between the sexes, with Zola's ideological position determined by the sex of the person who "wins," i.e. who survives the novel. Kelly seems to ignore that the "experimental novel" was also known as the naturalist novel, and that indeed not very many characters survive *any* of them. See Evelyn Fox Keller, "Gender and Science," in *Discovering Reality*; Evelyn Fox Keller, "Gender and Science: An Update," in *Secrets of Life, Secrets of Death: Essays on Language, Gender and Science* (New York: Routledge, 1992); Michèle Le Doeuff, *The Sex of Knowing*, trans. Kathryn Hamer and Lorraine Code (New York: Routledge, 2003) 144-55; Dorothy Kelly, "Experimenting on Women: Zola's Theory and Practice of the Experimental Novel," in Margaret Cohen and Christopher Prendergast, eds., *Spectacles of Realism: Gender, Body, Genre* (Minneapolis: U of Minnesota P, 1995).

⁷⁸ This scene is inspired by Edouard Manet's 1877 painting *Nana*, which was in turn inspired by Zola's initial descriptions of Nana in *L'Assommoir* (*Fabrique* 597).

⁷⁹ "voulant se mieux voir" (*Nana* 215).

⁸⁰ "il leva les yeux. Nana s'était absorbée dans son ravissement d'elle-même" (*Nana* 216). Parmée: "He looked up. Nana was lost in blissful contemplation of herself" (191). In Muffat's scenes of investigation, Zola always explicitly mentions the raising of the eyes. In contrast, when Nana looks around, she tends to look *down*; these directed gazes mimic the positions occasioned by the phantasmagoria and panorama respectively. Nana's downward gaze of course also perverts the feminine expression of shame typified by "downcast eyes"; instead of casting down her eyes as an expression of shame, here the female prostitute looks down from a powerful position of height.

⁸¹ "[R]eprise de ses curiosités vicieuses d'enfant." Parmée: "falling back into the vicious habits of her childhood" (191). The comparison to a mirror phase is inevitable here, especially with Zola's insistence on the childlike quality of Nana's fascination with her own motor skills.

⁸² "[E]n riant à l'autre Nana, qui, elle aussi, se baisait dans la glace" (*Nana* 217).

⁸³ "[L]'homme seul est capable d'acquérir de l'expérience et de se perfectionner par elle. ... L'expérience est donc le privilège de la raison" (Bernard 56). Although Bernard ostensibly uses "l'homme" in a gender-neutral sense, the dossier for *Nana* indicates how thoroughly Nana's position as the unaware force of destruction is determined by her femininity; the novel is, as Zola writes in the dossier, "le poème du cul," pointedly and insistently gendered feminine (*Fabrique* 416, f193).

⁸⁴ "singulièrement mêlé" (*Nana* 39).

⁸⁵ "On ne l'avait pas vue ainsi, le coup de soleil devrait la pouliche alezane d'une blondeur de fille rousse. Elle luisait à la lumière comme un louis neuf, la poitrine profonde, la tête et l'encolure légères, dans l'élancement nerveux et fin de sa longue échine.

“— Tiens! elle a mes cheveux! cria Nana ravie. Dites donc, vous savez que j’en suis fière!” (Nana 349).

Parmée: “Nobody had seen the sorrel filly looking like this before; she gleamed in the sun like a red-headed blonde, as golden as a freshly-minted guinea, deep-chested but with a light head, neck and withers flowing into her long, lean, slender but sinewy back.

“ ‘Good Lord! She’s got my hair!’ exclaimed Nana delightedly. ‘I say, you know, I’m proud of her!’” (331)

⁸⁶ “[C]ette heure dernière de fièvre” (Nana 348).

⁸⁷ “Alors, Nana, pour bien voir, monta debout sur une banquette de son landau [...]. D’un regard circulaire, elle embrassait l’horizon immense” (Nana 348).

⁸⁸ “[A]u centre, en baissant les yeux”; “domin[e] la plaine” (Nana 348).

⁸⁹ “En effet le *Panorama* n’est autre chose que la manière d’exposer un vaste tableau en sorte que l’œil du Spectateur embrassant successivement tout son horizon, et ne rencontrant partout que ce tableau, éprouve l’illusion la plus complète” (Buddemeier 165).

⁹⁰ “Et Nana, qui tournait lentement sur elle-même, voyait à ses pieds cette houle de bêtes et de gens, cette mer de têtes battue et comme emportée autour de la piste par le tourbillon de la course, rayant l’horizon du vif éclair des jockeys” (351). Parmée: “Twisting round to watch, Nana could see this surging mass of men and animals at her feet, a sea of heads tossed and almost swept away in the whirlwind of the race as the line of jockeys flashed across the horizon” (334).

⁹¹ “sans le savoir [...] comme si elle-même eût couru. Elle donnait des coups de ventre, il lui semblait que ça aidait la pouliche” (Nana 353).

⁹² “[E]n apothéose, la reine Vénus dans le coup de folie de ses sujets” (Nana 355).

⁹³ “[L]’on ne savait plus si c’était la bête ou la femme qui emplissait les cœurs” (Nana 355).

⁹⁴ “[N]’est que la chair” (*Fabrique* 416, f193).

⁹⁵ “En matière de livres et de drames Nana avait des opinions très arrêtées : elle voulait des oeuvres tendres et nobles, des choses pour la faire rêver et lui grandir l’âme” (Nana 318). Parmée: “Nana held very firm views on books and drama: novels should be full of sentiment and high principles, uplifting, something to make you dream!” (298).

⁹⁶ Du Bois is of course referring to black people in the United States, but it may be worth noting how the overwhelming “falsity” of Second Empire Paris, and particularly its headlong embrace of “science et industrie” in the context of Haussmannization, was seen as a form of futuristic and soulless “Americanization.” Thus the Goncourts wrote of the new Paris, “I am a stranger to what is coming, to what is, as I am to these new boulevards without turnings, without chance perspectives, implacable in their straight lines, which no longer smack of the world of Balzac, which make one think of some American Babylon of the future” (qtd. in Clark 35). Nana’s environment, too, might have been thought of as “this American world,” though the novel makes no explicit mention of such an attitude.

⁹⁷ Both Nana and Linda are also stage performers whose spectacularity on and off the stage recalls Laura Mulvey's classic formulation of the tension between visual pleasure (spectacle) and narrative in "Visual Pleasure and Narrative Cinema."

⁹⁸ Cheng argues that Linda's mutability is buttressed by the biracial actress Nancy Kwan's star persona, which was billed as an infinitely racially mutable body. But Cheng also notes how Kwan's reputation at the moment of *Flower Drum Song* (1961) also rested on her previous performance in *The World of Suzie Wong* (1960), in which she played a prostitute, whose very *occupation*, Clark notes, is one of "provid[ing]...falsity" (Cheng 51; Clark 111). The mutability of the prostitute as a type does not detract from Cheng's point, but only adds to the overdeterminedly multiplicitous quality of Kwan's body in the context of *Flower Drum Song*.

⁹⁹ "[L]à, devant ses yeux, dans sa chair"; "Il avait conscience de sa défaite, il la savait stupide, ordurière et menteuse, et il la voulait, même empoisonnée" (*Nana* 217). Parmée: "He realized he was beaten; he knew she was stupid, obscene, and a liar but he wanted her, poisonous as she was" (192-3).

¹⁰⁰ I include the texts here for comparison (emphasis added). It is worth noting that the same language appears in Zola's original character sketches of Nana in the dossier (*Fabrique* 418, ff. 192-3).

Chapter seven:

La chronique de Fauchery, intitulée *La Mouche d'or*, était l'histoire d'une fille, née de quatre ou cinq générations d'ivrognes, le sang gâté par une longue hérédité de misère et de boisson, qui se transformait chez elle en un détraquement nerveux de son sexe de femme. Elle avait poussé dans un **faubourg**, sur le pavé parisien ; et, grande, belle, de chair superbe ainsi qu'une plante de plein fumier, elle **vengeait les gueux et les abandonnés** dont elle était le produit. Avec elle, la **pourriture** qu'on laissait fermenter dans le peuple, remontait et **pourrissait** l'aristocratie. Elle devenait une force de nature, un ferment de destruction, sans le vouloir elle-même, corrompant et désorganisant Paris entre ses cuisses de neige, le faisant tourner comme des femmes, chaque mois, font tourner le lait. Et c'était à la fin de l'article que se trouvait la comparaison de la mouche, une **mouche** couleur de soleil, envolée de l'ordure, une mouche qui prenait la mort sur les charognes tolérées le long des chemins, et qui, bourdonnante, dansante, jetant un éclat de pierreries, **empoisonnait les hommes rien qu'à se poser sur eux**, dans les palais où elle entrait par les fenêtres. (215)

Chapter thirteen:

Son oeuvre de ruine et de mort était faite, la **mouche** envolée de l'ordure des **faubourgs**, apportant le ferment des **pourritures** sociales, avait **empoisonné ces hommes, rien qu'à se poser sur eux**. C'était bien, c'était juste, elle avait **vengé** son monde, **les gueux et les abandonnés**. Et tandis que, dans une gloire, son sexe montait et rayonnait sur ses victimes étendues, pareil à un soleil levant qui éclaire un champ de carnage, elle gardait son inconscience de bête superbe, ignorante de sa besogne, bonne fille toujours. (422)

¹⁰¹ "Comme ces monstres antiques dont le domaine redouté était couvert d'ossements, elle posait les pieds sur des crânes; et des catastrophes l'entouraient..." (*Nana* 422). Parmée: "Like those dreaded monsters of old whose lairs were littered with bones, she was walking on skulls and surrounded by cataclysms" (409).

¹⁰² "dans une gloire, son sexe montait et rayonnait sur ses victimes étendues, pareil à un soleil levant qui éclaire un champ de carnage" (*Nana* 422). Parmée: "while the fiery red of her pubic hair glowed triumphantly over its victims stretched out at her feet, like a rising sun shining in triumph over a bloody battlefield" (409).

¹⁰³ Nana "gard[e] son inconscience de bête superbe" (*Nana* 422).

¹⁰⁴ "Être maître du bien et du mal, régler la vie, régler la société, résoudre à la longue tous les problèmes du socialisme, apporter surtout des bases solides à la justice en résolvant par l'expérience les questions de criminalité..." (*Roman* 24).

¹⁰⁵ "un homme qui réalise dans une oeuvre d'art une idée ou un sentiment qui lui est personnel."

¹⁰⁶ "...celui qui accepte les faits prouvés, qui montre dans l'homme et dans la société le mécanisme des phénomènes dont la science est maîtresse, et qui ne fait intervenir son sentiment personnel que dans les phénomènes dont le déterminisme n'est point encore fixé, en tâchant de contrôler le plus qu'il le pourra ce sentiment personnel, cette idée à priori, par l'observation et par l'expérience." (*Roman* 52)

¹⁰⁷ "[L]e naturalisme ... consiste uniquement dans la méthode expérimentale, dans l'observation et l'expérience appliquées à la littérature. La rhétorique, pour le moment, n'a donc rien à voir ici" (*Roman* 46).

¹⁰⁸ "Au fond, j'estime que la méthode atteint la forme elle-même, qu'un langage n'est qu'une logique, une construction naturelle et scientifique" (*Roman* 46).

¹⁰⁹ Noting that "[t]he arts are associated with sexual pleasure, the sciences with sexual restraint," L. Hudson makes explicit the correlation between the moral restraint of objectivity and sexual restraint (qtd. in Keller 189).

¹¹⁰ Daston and Galison are careful to distinguish mechanical objectivity from aperspectival objectivity, and I do not mean to conflate the two here. As Daston and Galison point out, mechanical objectivity, as epitomized by the photograph, is profoundly perspectival. What I wish to highlight here is the way that Nana's panoramic vision is multiperspectival, which was precisely the source of the panorama's reality-effect.

¹¹¹ As Vanessa Schwartz has detailed, the panorama met with new popularity in the 1880s, not long after the publication of *Nana*. Schwartz notes the suddenness of what she calls “fin-de-siècle *panoromania*”: “[I]n 1880 Parisians and visitors could see only one panorama, the defense of Paris during the siege, which had been open on the Champs-Élysées since 1872. By 1882 Paris boasted eleven panoramas and by 1889 seventeen, including those featured as part of the exposition” (150). The late Parisian panoramas departed from the late eighteenth- and early nineteenth-century panoramic aesthetic of illusion in order to “[construct] reality as some version of the newspaper.” Schwartz notes in particular a panorama called *Le Tout Paris*, representing the place de l’Opéra and groups of local celebrities. In Schwartz’s reading, the painting broke with panoramic *trompe l’oeil* conventions, but harmonized perfectly with newspaper representations of the boulevards, to the point that the government asked to have the panorama updated when one figure, the politically threatening General Boulanger, lost an election and left the country. Castellani, the painter, complied, and Boulanger’s image was excised (166-8). If Schwartz is correct, then we are faced with an interesting possibility: that shortly after *Nana* was published, the meaning of the panoramic gaze changed substantially.

¹¹² Michèle Le Doeuff has argued that the characteristics attributed to women have historically been those just going out of intellectual fashion; thus “intuition” is only attributed to women after intuition has been subordinated to reason as an intellectual value (17). The attribution of an eighteenth-century mode of objectivity, now discredited as “bête,” to *Nana* seems to fit this pattern. We will see the pattern repeated in Chapter Four, where we will see that popular forms of natural history such as bird-watching, which adhered to visual norms considered passé by professional naturalists, were feminized.

¹¹³ For an account of the *feuilleton*, see for example Adamowicz-Hariasz.

¹¹⁴ As Gunning observes, the confluence of spectacle and method also found its way into experimental film, in particular in the “‘experimentally regulated and mathematically calculated’ montage of attractions demanded by Eisenstein” (Gunning 66).

Chapter Three

Seeing Clear: The Objectivity of “Melanctha”

“ ‘Why’ she said in a tone of intense interest, ‘its like a bit of mathematics. Suddenly it does itself and you begin to see.’ ”—

Gertrude Stein, *Q.E.D.*¹

“[T]he Photograph...represents that very subtle moment when, to tell the truth, I am neither subject nor object but a subject who feels he is becoming an object...”

—Roland Barthes, *Camera Lucida*²

We are told at the beginning of “Melanctha” that “Melanctha Herbert was a graceful, pale yellow, intelligent, attractive negress. She had not been raised like Rose by white folks but then she had been half made with real white blood” (*Three Lives* 125). Immediately our attention is drawn to Melanctha’s body, “graceful,” “pale yellow,” and “attractive”; her intelligence is perhaps also inborn. Her nurture is dismissed: unlike her friend Rose Johnson, with whom she is contrasted, Melanctha was not raised by “white folks,” but, we are told, racial extraction counts for as much if not more: “she had been half made with real white blood.” It is not clear what “real white blood” might be, neither of Melanctha’s parents being identified as white. Nor is it clear how a human body might be “half made” out of this mysterious substance. But the declaration foregrounds Melanctha’s physical composition as all-important, and, simultaneously, renders that composition a problematic site of inquiry. And it is not just that we cannot understand the strangely mechanical, “half made” composition of Melanctha’s body. Despite the implied assurance that the body is wholly explanatory, Melanctha herself belies this theory, for Stein soon poses the question:

Why did the subtle, intelligent, attractive, half white girl Melanctha Herbert love and do for and demean herself in service to this coarse, decent, sullen, ordinary, black childish Rose, and why was this unmoral, promiscuous, shiftless Rose married, and that’s not so common either, to a good man of the negroes, while Melanctha with her white blood and attraction and her desire for a right position had not yet been really married (125).

Stein simultaneously proposes and undercuts the notion that the body explains behavior and social roles, and that, moreover, a more “white” body should be expected to correlate with higher social standing and marriage. We are made to understand these rather remarkable assumptions by the way that Melanctha’s body violates them, for whatever her body, “half made with real white blood,” does, it does not bring Melanctha social standing; indeed, this *non*-correlation between physical composition and social standing turns out to be “how all her world was made” (125). The physical composition of Melanctha’s body, how it was “made,” does not seem to figure in the physical composition of her world. The promise of the body, that what it is “made with” should manifest socially, is immediately revealed as a false one.

The body’s failure to guarantee social standing elicits psychological anguish and suggests that the body should be annihilated, as we immediately learn. Melanctha apprehends “how all her world was made,” and this “thought” reveals her as “complex, desiring,” and “filled...with despair” (125). Yet Melanctha’s psychological complexity, occasioned by apprehending the mismatch between how her body and the world are made, is already once again typological—Melanctha’s is the complexity of the tragic mulatta, so that even psychological complexity returns us to the grounds of the typed body: “She wondered, often, how she could go on living when she was so blue.”³ Although being “blue” clearly alludes at first to depression, the repetition of “blue” and the refusal to name the affliction in any other terms centers attention on the word itself. Psychological anguish is thus recast as a physical attribute, the color blue, a physical property surely no more unlikely than a body described in the defamiliarized terms of being “half made with real white blood.” Psychology is then once again a problem of the body, understandable in the terms of physical attributes and occasioned by a failure of the body, a failure of physical composition and a failure of making. And it is, moreover, a problem to be solved on the grounds of the body: killing the body stops it being “blue.”

“Melanctha Herbert never really killed herself” (238), but Melanctha does indeed die by the end of the story, and although tuberculosis is ostensibly the cause of death, we are made to understand that what kills her is something that has been lurking in her all along, not only tuberculosis but her “bottom nature,” as Stein would put it. Melanctha, like Nana, is an ambiguously racialized, bisexual woman subject to medico-scientific scrutiny, as Daylanne English has powerfully shown in her reading of *Three Lives* as a trio of medical case histories. Even if tuberculosis is the disease that happens to kill Melanctha, the rapid way in which the narrative shuts down after her decisive rejection by Jem Richards discloses the propensity to shut down that was in Melanctha all along — a propensity that is psychological, but no less rooted in the body for that. As with Nana, we see that it is a *constitutive* malady, a bottom nature that is physiologically determined, that kills her. Melanctha has a “break neck courage” (128, e.g.), a nature that, as several critics have observed, tends toward self-destruction.⁴ If “Melanctha” is a case history detailing the etiology of Melanctha’s constitutive malady, a “life” that is *the same* as a disease, then it invites the reader to hazard a diagnosis.

And indeed, diagnosis has been the favorite activity of critics of “Melanctha”; the text’s outward manifestations are read as signs of a hidden interior. One diagnosis of Melanctha’s malady has been blackness; the abstract categories of race lie on the surface of the story with almost parodic ubiquity, offered as a motivation for nearly everything and described with conscious heavyhandedness (e.g. “the wide, abandoned laughter that makes the warm broad glow of negro sunshine”).⁵ Prominent African American authors like Richard Wright and Nella Larsen have praised “Melanctha,” and particularly its linguistic patterns, as a mimetic representation of black culture, puzzling critics who read the story as mimetic only insofar as it is caricatured and racist.⁶ If Melanctha’s malady is race – being half made with real white blood – then “Melanctha”’s malady is racism.

The other major diagnosis of “Melanctha” is lesbianism – a reading perhaps more subtle, but in another sense more aggressively diagnostic. Critics like Marianne DeKoven and Catharine Stimpson have argued persuasively that Melanctha is a lesbian figure. The first piece of evidence to be advanced would be Melanctha’s intense relationship with Jane Harden. The second is that, lurking under the surface of “Melanctha” like the malady lurking under the surface of Melanctha’s body, is an earlier, explicitly lesbian autobiographical text, Stein’s 1903 novella *Q.E.D.*, published posthumously (1950) by Alice B. Toklas and the critic Leon Katz. Digging under the surface of “Melanctha,” these critics reveal a more fundamental ur-text wherein must lie the truth of “Melanctha.” What Bridgman, North, and others read as black dialect is here re-read as “a different language,” as DeKoven puts it, an anti-patriarchal lesbian language of resistance and desire.

More recently, critics like Corinne Blackmer, Michael North, and Laura Doyle have complicated this diagnosis by introducing the figure of the mask and conscious performance—a malingering, perhaps. But while these critics’ diagnoses of the confounding variables of sexuality and race usefully nuances critical understandings of the text, I wish to draw attention to the logic of diagnosis itself, what I argued in the previous chapter is a logic of naturalism. As in Nana’s case, the malady in Melanctha is the malady that is Melanctha; thus, like Nana, Melanctha must die “en pleine jeunesse”; implosion is required (Zola, *Fabrique* 416). And somehow, just as Melanctha’s constitutive malady invites diagnosis, so too does “Melanctha” seem to invite the same, even for critics who ultimately see “Melanctha” as an unmasterably experimental text. Serving as a site of overlap between naturalism and modernism, “Melanctha” positions itself as both agent and object, experimenter and experimentée. Indeed, one of this chapter’s arguments will be that this duality in “Melanctha” may be attributed to the fact that it belongs both to experimental modernism and to naturalism, and that, moreover, there is no contradiction in saying so—that “Melanctha” is experimental *insofar as* it is naturalist. That Jennifer Fleissner, in a book on naturalism, and Marianne DeKoven, in a book on modernism, read “Melanctha” in strikingly harmonious terms may serve as circumstantial evidence for what will become more directly apparent over the course of this chapter.⁷ Of course, I am far from the first person to call “Melanctha” a naturalist text. A widely accepted periodization of Stein’s career starts with a naturalist phase (through *The Making of Americans*), “peaks” with a highly experimental phase (*Tender Buttons*, *Geography and Plays*, *Lucy Church Amiably*),

and finishes with a more “popular” phase epitomized by *The Autobiography of Alice B. Toklas*. I more or less accept this periodization, broadly. I wish to put pressure on it, however, by elucidating the generative potential of devalued categories like “naturalism” or “the popular,” especially as they relate to the “experimental.”⁸

Technically, the “naturalist” period includes a period of realism, in which Stein composed *Q.E.D.* and *Fernhurst*. These early works are relatively little known. This is attributable in part to their posthumous publication, but there has also simply been a relative lack of critical interest in a realist Stein.⁹ “Conventional” is an adjective frequently applied to these writings.¹⁰ This is not to say that the realist texts have been entirely neglected; most overviews of Stein’s work mention *Q.E.D.* and *Fernhurst*, and critics like Catharine R. Stimpson and Janice L. Doane have advanced substantial readings. *Q.E.D.* has received particular attention as an autobiographical text and as a precursor to “Melanctha.” Moreover, the overtly lesbian love plots in both texts have made them sites of particular interest for gender and women’s studies and queer studies. My point is not that the early realist texts have been unfairly neglected but that they have often been studied as aberrations in Stein’s oeuvre; indeed, an interest in the “experimental” Stein has almost seemed to preclude an interest in the realist Stein.

Although it would be impossible to deny the importance of *Three Lives* and *The Making of Americans*, a shadow of this critical suspicion has clung to these texts insofar as they have been identified as “naturalist”—a result, I suspect, of the heuristic shorthanding of naturalism as “a sort of inner circle of realism” (Norris 1106). Thus both Donald Sutherland and Michael J. Hoffman identify these works as naturalist, but neither critic seems much interested in the connection, preferring to emphasize how Stein’s radical ideas about literature “enabled her to go beyond any of her fellow determinists” (Hoffman 18). If anything, for Stein’s early major critics, naturalism seems to be an ignominious connection. Sutherland in particular explicitly rejects Émile Zola as a model for Stein, contradicting Stein’s comment in *Paris France* (1940) that she had once had “a certain interest in Zola as a realist” (7) by characterizing “scientific causality” (and therefore Zola’s naturalism) as simplistic: “Truth for Zola was simply and finally scientific causality, whether biological or social” (Sutherland 25). The clear implication is that late nineteenth century concepts of scientific causality could be understood as simple and final. Such readings of naturalism have led to the devaluation of Stein’s pre-*Tender Buttons* writing, or its valuation only insofar as it “go[es] beyond” naturalism.

Steven Meyer offers a valuable corrective to shorthanded versions of nineteenth-century science in his *Irresistible Dictation: Gertrude Stein and the Correlations of Writing and Science*. Meyer’s interest in the experimental Stein overlaps with my own, since, like myself, he wishes to take seriously the idea that Stein’s “experimental” writing has something really to do with scientific experiment. Yet for Meyer as for Sutherland and Hoffman, this still seems to entail downplaying the importance of the writings that intervened between Stein’s scientific work and the work that he considers truly experimental, starting with *Tender Buttons*. Indeed, he also downplays the importance of the scientific work itself. Stein’s scientific education, Meyer argues, was based on understanding science as merely

descriptive “knowledge-about,” in William James’s terms. This descriptive impulse was manifested in *Three Lives* and especially *The Making of Americans* as “continuous repeating”; “[c]areful attention to repetition, with its capacity for ‘minutest variation,’” Meyer writes, “supplied Stein at this stage of her career with a methodology appropriate in equal measure to her research and her writing” (4). In this account, the lesser science of repetition and description, first conducted in a lab and then in a form of naturalist fiction, soon gives way to a more thoughtful, more genuinely scientific experimentalism with *Tender Buttons*, one that, following Alfred North Whitehead’s model of “organic mechanism,” established a rapport between intuitive modes and science (4). But while Meyer bases this account of empirical science on comments made by Stein herself, as Robert Chodat points out, “whatever the origin of the idea, it is important to understand what an impoverished conception of scientific inquiry it actually is” (591).¹¹ Thus, although actively invested in a nuanced account of the sciences, Meyer’s study oddly reproduces elements of Hoffman’s and Sutherland’s account by effectively staging a competition between experimental science and experimental writing—one that experimental writing must win, and that experimental science per se must lose. A phase that employs “a methodology appropriate in equal measure to [Stein’s] research and her writing” is therefore demoted to sub-experimental status, implicitly suggesting that Stein’s actual scientific experiments were something less than experimental. But as the example of Zola shows, even a “mechanistic” science is far from simplistic or stable; moreover, its translation into the domain of experimental literature is not straightforward. As Maria Farland has so effectively illustrated—and, indeed, as Meyer suggests elsewhere in his book—the science that Stein practiced was not only something more than descriptive “knowledge-about,” but also *not stable*. Following critics like Meyer and Farland who agree that Stein’s experimentalism “has its roots ... in the history of medical science” (Farland 118), I would argue that the character Melantha, with her typed body “half made with real white blood,” poses questions of how to know the visible body, questions that were once posed by the early proponents of experimental medicine.

I. Bad Scientist: The Harvard Psychological Laboratory and Bottom Natures

Canonically, Gertrude Stein is thought of as one of the great “experimental” modernists. Critics have also frequently discussed Stein’s connections to science, in part because the minimal condition that *a* connection exists is so easy to establish: Stein studied experimental psychology at Harvard-Radcliffe and then proceeded to the Johns Hopkins University’s medical school. Like Émile Zola, this experimental writer is also easily associated with a number of “real scientists,” notably the psychologist William James and the physiologist Franklin Paine Mall.¹² What is more difficult to articulate is *how* Stein’s early practice of scientific experiment relates to her practice of literary experiment. The question is further complicated by the fact that Stein’s most famously experimental work was written at something of a distance from her studies in science. Steven Meyer and Jennifer Ashton, among others, have privileged *Tender Buttons* (1914) as Stein’s great

experimental breakthrough, though Stein left Johns Hopkins in 1903. The result is an account of Stein's career that tends to presuppose rupture and gaps. I therefore wish to fill in some chronology in order to bring into relief what I read as important continuities from her time in college through the 1910s. What my account will suggest is that Stein's abiding interest in typology correlates with an increasing commitment to objectivity, one best understood in the context of the turn-of-the-century figure of *female* objectivity.

Stein studied science actively at Harvard-Radcliffe from 1893 to 1897 and at Johns Hopkins from 1897 to 1901. During this period she published two papers in Harvard's *Psychological Review*, and attempted to publish a third paper in the *American Journal of Anatomy* in 1902.¹³ The first paper, "Normal Motor Automatism" (1896), was co-authored with William James's student Leon Solomons. Solomons wrote up the findings, and Stein later claimed that she had never agreed with Solomons's conclusions (*Everybody's Autobiography* 267). The second paper, "Cultivated Motor Automatism" (1898), was published by Stein alone. Much has been made of Stein's work under William James, especially as a means of authorizing her as a scientist in the strict sense. But in her lecture "The Gradual Making of *The Making of Americans*," Gertrude Stein describes her research in college as a kind of unruly or bad science:

[O]ne of the things I did was testing reactions of the average college student in a state of normal activity and in the state of fatigue induced by their examinations. I was supposed to be interested in their reactions but soon found that I was not but instead that I was enormously interested in the types of their characters that is what I even then thought of as the bottom nature of them. (271)

The young Stein's wayward interest veers from individual subject reactions to character typology, the famous "bottom nature." The "finding" arising from that experiment, meanwhile, is less about the subjects than about Stein's own interest: "I was supposed to be interested in their reactions but soon found that I was not." Stein's move to foreground her own interest as the location of discovery (the thing "found") is consistent with a Jamesian radical empiricism, which sought in part to account for the experimenter's role in experiment. In Meyer's words, "[r]adical empiricism is empiricism divorced from the idea of the primacy of sense-data; instead it stresses the decisive role of processes and procedures, of conjunctive as well as disjunctive relations, in the composition of experience" (13). But while a radical empiricist outlook may partially account for this moment, I am more interested in the faint moralization that creeps into it—the sense that, by finding herself interested in bottom natures, Stein is finding herself almost unwillingly transgressing a norm. The transgression is not merely a failure to comply with pedagogical expectations; it seems to reflect a kind of transgressive desire. But the object of desire—or perhaps its intellectual analogue, "interest"¹⁴—is not a person but an epistemological framework; Stein's interest attaches to the wrong phenomenon, and with it a whole set of scientific positions and assumptions. The experiment that Stein describes here is her second scientific publication, the single-authored "Cultivated Motor Automatism." Stein seems to concur with the several critics who have noted that "Cultivated Motor

Automatism” represents a significant departure from her earlier paper, “Normal Motor Automatism,” co-authored with William James’s graduate student Leon M. Solomons. Though Stein and Solomons performed the earlier experiment (really a series of related experiments) together, the paper itself was written up by Solomons, and Stein later distanced herself from his conclusions. We can therefore think of “Normal Motor Automatism” as operating in an experimental paradigm that Stein, if we are to accept her later remarks, was already questioning.

“Normal Motor Automatism” was designed as a series of experiments in automatic writing, with Stein and Solomons serving as the experimental subjects as well as being the experimenters. Stein and Solomons tried to reproduce in “normal” subjects—themselves—the symptoms of the “second personality” thought to be a feature of hysteria. Writing, usually considered a conscious and even creative activity, was to be shown as something that the body could undertake without the participation of the conscious self. “Normal Motor Automatism” thus intervenes in an ongoing debate in studies of consciousness about whether a second consciousness could exist.¹⁵ “Normal Motor Automatism” seeks to compare the phenomena of “double personality” noted in “hysterical subjects” to the automatic states that could be induced in “normal” subjects. Arguing that automatic movements can be induced in normal subjects that are indistinguishable from phenomena observed in hysterical subjects, Solomons and Stein suggest that there is no “double personality” by, in effect, suggesting that all people have something like a double personality, a tendency toward automatism that emerges from the body rather than from a mysterious unconscious.¹⁶ Solomons and Stein are careful to specify that this automatism is normal and merely rendered observable by distraction.¹⁷ The distinction is more affective than conceptual: rather than suggesting, as Freud does, that even the normal subject has uncanny and perhaps frightening qualities, Solomons and Stein domesticate automatism, making it physiological and “normal.” The so-called second personality, they argue, is simply the normal functioning of the body when unregulated by the conscious will. This is a rather fine line to walk; Solomons and Stein must maintain that the subjects are completely normal, and at the same time establish that the automatism observed is really automatism. Thus Solomons writes of their experimental design,

Above all, we wished to avoid anything like a real production of a second personality. For the experiments to really settle the point at issue it was essential that no suspicion should rest upon the complete ‘normality’ of the subject throughout the experiments. Our idea was to reproduce rather the essential elements of the ‘second personality,’ if possible in so far as they consist of definite motor reactions unaccompanied by consciousness

(493)

Solomons’s anxious, slightly moralistic tone as he sets out these fine distinctions between a second personality and “the essential *elements*” thereof—banishing “suspicion”—only underscores how the “normal subject” of this study emulates, and thus is always in danger of being confused with, a pathological one. Solomons seems aware of steering dangerously close to the realm of hysteria, while needing, for *scientific* reasons, to avoid its taint

absolutely. The scientific imperative is met in the same way as the social imperative: through the exercise of self-control, or what Barbara Will names “an *attentive inattentiveness*” (25). Indeed, it is the ability to exercise self control that, for Solomons and Stein, distinguishes the normal subject from the hysteric. “Our trouble [in inducing normal motor automatism],” Solomons argued, “never came from a *failure of reaction*, but from a *functioning of the attention*. It was our inability to take our minds off the experiment that interfered. [...] The hysterique [sic] has no trouble here, for he is *unable to attend* to the sensation, attention to which bothered us” (502). The way that Solomons attributes inability, first to the normal subject, then to the hysterical subject is instructive here. The normal subject, with superior powers of attention, naturally attends to her own movements, responds to the “almost irresistible” “desire to take charge of it,” and therefore stops any motor automatism. Solomons at first describes this as an “inability to take our minds off the experiment,” but then transfers the label of inability to the hysterical subject’s *opposite* tendency, an “[inability] to *attend*.” In the context of the experiments, each kind of subject exhibits an insufficiency—in the case of the normal subject, an inability to manifest the desired phenomenon; in the case of the hysterical subject, an inability to control the attention—but only one of these can be remedied. The hysterical subject can never be made to attend, but the normal subject’s attention can be turned to suppressing attention, exerting a doubled control where the hysteric can exert none. That the phenomenon theorized as “attention” was in practice conflated with the will—a will that the hysteric lacks—is evident in Solomons’s language: “We *would* not, the hysterique [sic] *can* not, attend to these sensations [of motor automatism],” he writes (511).

“Normal Motor Automatism” therefore both thematizes and enacts some fundamental quandaries in how to do science. Stein and Solomons had to embody dualities on at least three levels. First, they inhabited dual roles, as both experimenters and experimental subjects. Second, as scientists, they had to maintain the Bernardian split between willful creativity (as a hypothesizing experimenter) and willful self-suppression (as the objective observer), both positions being integral, according to Bernard, to the work of the experimental scientist. And finally, as experimental subjects, they had to reproduce the self-splitting of the hysteric, again divided between willful consciousness and the willful suppression of consciousness (to allow motor automatism to manifest). “Normal Motor Automatism” turns on distinctions between investigator and subject, hypothesizer and observer, “normal” and (quasi-)hysterical, which are, as Friedrich Kittler points out, *gendered* positions.¹⁸ Moreover, these distinctions are maintained solely by a heroic self-control, the strenuousness of which task Solomons makes us feel over and over again:

Nothing is more difficult than to allow a movement of which we are conscious to go on of itself. The desire to take charge of it is almost irresistible. But as we shall see later it is a habit that can be overcome, and a trained subject can watch his automatic movements without interfering with their non-voluntariness. (496)

The multiple negations in this passage—“[n]othing is more difficult,” “irresistible,” “without interfering with their non-voluntariness”—are striking, and perhaps emblematic of the

complicated position of the subject who must constantly self-regulate. Moreover, the nature of the experiments frequently collapsed the roles of investigator and subject, since, as Solomons admits, the phenomena of consciousness can only be observed by being “directly experienced” (493); thus Stein and Solomons sometimes had to engage in all three dualities *at the same time*—dualities which did not map neatly onto one another, for all their resonances. In this series of experiments, Solomons and Stein both slip in and out of feminized states of quasi-hysteria, automatism, passive observation, and experimental subjecthood. We must notice the tremendous pressure that is put on the will here: the willpower that sustains objectivity is also the willpower that produces objecthood—the quasi-hysterical “automatic” state. Thus the experimenter-subject becomes “a machine among machines,” as Kittler puts it (219), neutral, reliable, and finally the being capable of observing scientifically and simultaneously the being worthy of being scientifically observed. While I will argue that Stein’s experimental practices depart significantly from “Normal Motor Automatism,” the potential for confusion between objective scientist and object of science—which is not a gender-neutral issue—remains crucial as Stein continues to interrogate (and practice) scientific objectivity.

“Normal Motor Automatism” is a fascinating text, which no doubt accounts for the disproportionate attention that has been paid to it. It must be remembered, however, that Stein was not responsible for the final write-up that appeared in the *Psychological Review*; that in *Everybody’s Autobiography* she went so far as to attribute the data analysis entirely to Solomons, and to disagree with it; and that she wrote up her own experiment two years later that differed significantly from the first article in both content and tone. For some reason, critics have focused heavily on “Normal Motor Automatism”; Tim Armstrong focuses on the earlier paper to the near exclusion of the latter, mentioning Stein’s single-authored “Cultivated Motor Automatism” only in passing and unequivocally designating the earlier paper “the more important” (198); Kittler never mentions “Cultivated Motor Automatism” at all.¹⁹ Barbara Will, meanwhile, expresses dismay at Stein’s shift from what she (I think questionably) characterizes as a “radical awareness” that “the subject is by definition fractured” in “Normal Motor Automatism” to the “totalizing” and “reductive” typological bent of “Cultivated Motor Automatism” (33, 32, 33). Yet it is not clear why a *female scientist* would be invested in a procedure of “questionable objectivity,” as Will herself puts it (24), especially when that questionable objectivity made it easy for her to be reduced from the position of the scientist to a quasi-hysteric. Moreover, as Armstrong acknowledges, it is in reference to “Cultivated Motor Automatism” that Stein made the comment with which I began this section, describing how her wayward interest turned from the subjects’ reactions to “the types of their characters” (GMMA 271), and it is this wayward interest, so disturbing to Will and others, that seems to initiate Stein’s literary experimentalism. Moreover, the terms on which Stein distances herself from “Normal Motor Automatism” are telling. “I did not think that either of us had been doing automatic writing,” she writes, “we always knew what we were doing how could we not when every minute in the laboratory we were doing what we were watching ourselves doing, that was our training” (EA 231). Retrospectively, Stein refuses the possibility of the

very slippages that underwrite “Normal Motor Automatism” in the first place: the possibility even of simulating the hysterical symptom of automatism by appealing to the intractable conditions imposed by the place—the laboratory—and the experimenters’ professionalism—their “training.” Nor can Stein’s retrospective representation of “Normal Motor Automatism” be attributed to a late refusal of the fractured subject, for it is consistent with the direction she takes in her single-authored paper, “Cultivated Motor Automatism.”

Stein begins “Cultivated Motor Automatism” by characterizing it as an extension of “Normal Motor Automatism,” with a crucial difference: she uses many more subjects—forty-one men and fifty women (295-6). This difference clearly rectifies a shortcoming in the earlier paper; “The only subjects we had [in ‘Normal Motor Automatism’],” Stein notes apologetically, “were ourselves.” This methodological change, from experimenting on oneself to experimenting on ninety-one subjects, according to Will, “works to underscore authorial ‘objectivity’ and epistemological certainty above all else” (33)—values of which Will, a heritor (like myself) of a post-Foucauldian history of science, is clearly suspicious. Yet the very concept of power/knowledge precisely means that power is not repressive but productive of knowledge. The protocols that separate the scientist-observer from the experimental subject do not exist merely to ensure the scientist’s privileged position, but also to make knowledge more systematically accessible. Enlarging the sample size by a factor of forty-five thus “underscore[s] ... epistemological certainty,” as Will puts it, for a reason. The introduction of ninety-one experimental subjects allows Stein not only to “continue” the work of “Normal Motor Automatism” but also to consider other factors that might correlate with automatism, specifically “character type,” gender, and, in the case of the female subjects, the effects of fatigue (Stein did not have access to the male subjects in a state of fatigue).

Stein’s single-authored paper, then, makes a move toward greater objectivity, which in turn enables a move toward more rigid typology. There was, it should be clear, no possibility of examining typology in the earlier “Normal Motor Automatism,” with its mere two experimental subjects. And although, as Farland has shown, sex-based typing would later emerge as important in *The Making of Americans* in the form of Otto Weininger’s theory of variability, Stein found that “[t]he difference in response between the male and female subjects was not very pronounced” (304). Much more important in “Cultivated Motor Automatism” are the two character types that Stein identifies—“fire and phlegm,” as Stimpson glosses them (“Mind” 498)—which, as critics have noted, roughly correspond to the characters of Helen and Adele in *Q.E.D.*, and later, Melanctha and Jeff. Type I, Stein writes, is “nervous, high-strung, very imaginative, [and] has the capacity to be easily roused and intensely interested.... This type, although in some cases suggestible, is on the whole auto-suggestible rather than responsive to influences from without, unless the appeal is directed completely to the automatic personality”—that is, the automatic, purely physiological “personality” thought to have been identified in the earlier “Normal Motor Automatism” experiments (297). But while it is not surprising that the automatic personality is assumed to be physiological, it is notable that the tendency to be “very

imaginative” and “intensely interested”—tendencies that anticipate the “complex, desiring” Melanchtha—are routed through the quasi-physiological faculty of “attention,” and are thus already part of, indeed distinguishing features of, a type.²⁰ Subjectivity is not imagined as exceeding typology. Type II, similarly, is defined by subjective states; the type is “distinctly phlegmatic....If emotional, decidedly of a weakish sentimental order....Their power of concentration is very small.” Since the types, defined by capacities of attention, are rooted in the body, it is perhaps not surprising that Type II comes with explicit physical markers: “blonde and pale....They may be either large, healthy, rather heavy and lacking in vigor, or they may be what we call anaemic and phlegmatic” (297). Finally, Type II is suggestible and similar to the type “described in books on hysteria”; the Type II subjects’ “automatic personalities,” owing to their weak powers of attention, easily overtook or merged with their “real” personalities (298). Thus “Cultivated Motor Automatism” is characterized by an overwhelming interest in typology, especially as compared to “Normal Motor Automatism”; indeed, the thirteen cases described in the paper are first and foremost classified according to type, except for one subject, who is oxymoronically designated as belonging to an “Intermediate Type” (304). This typing extends even to geographical region:

A large number of my subjects were New Englanders, and the habit of self-repression, the intense self-consciousness, the morbid fear of ‘letting one’s self go,’ that is so prominent an element in the New England character, was a constant stumbling-block. It usually took a New Englander a sitting longer to give a response than the other subjects. I could usually tell them as soon as I began the experiment by their resistance to my guidance. Afterwards I found that [psychologist G.] Stanley Hall, in his article on Fears, notes the fact that self-consciousness was dreaded by twenty-four boys in Cambridge, Mass., a thing unknown in Trenton or St. Paul. (299)

Of the typological theories suggested in Stein’s article, the one that correlates character with geographical region has the least credibility today, yet it, like the other typological observations made in “Cultivated Motor Automatism,” is made possible by the increased number of experimental subjects, a feature of the effort “to underscore authorial ‘objectivity’ and epistemological certainty above all else” (Will 33). Objectivity creates a distance between the knower and the thing known; it does not, however, impose constraints on the kinds of data gathered, such as, for instance, the subject’s geographical region of origin. We may not, therefore, suppose that greater objectivity is necessarily equivalent to greater scientificity, greater truth, and therefore (in accordance with contemporary psychology) less rigid typological thinking; here, indeed, we see quite the reverse correlation. Stein’s solo article not only moves her away from the self-reflective radical empiricism of the earlier collaborative experiments and the reactions in which she is “supposed to be interested” but also toward “the types of [the subjects’] characters” and a more objective methodology. Stein “exchang[es] a practice rooted in James’s physiological psychology,” as Steven Meyer puts it (55-6), not for a “subjective” science so much as for an objective one—a very objective one, as I will argue.

The same interest in character types rooted in the body and in geographical regions that marks “Cultivated Motor Automatism” reappears at the beginning of *Q.E.D.*, the semi-autobiographical 1903 novella on which “Melanctha” would be based. Describing the three main characters, Stein writes, “Their appearance, their attitudes, and their talk both as to manner and to matter showed the influence of different localities, different forebears and different family ideals” (4). At the same time, however, Stein undercuts the correlation between the visible body and the character type; “[it] is one of the peculiarities of American womanhood,” the narrator of *Q.E.D.* intones, “that the body of a coquette often encloses the soul of a prude and the angular form of a spinster is possessed by a nature of the tropics” (4). The confusion of character types (“the soul of a prude”), bodily forms (“of a coquette”), and localities (“of the tropics”) here anticipates the positing and undercutting of typologies in “Melanctha.” But I wish to emphasize that what is undercut here is less typology itself than the assumption that type corresponds to the *visible* body. The body is determinate, yet vision lies. Abstracting the visible body (into “the body of a coquette,” as if such a thing were instantly recognizable) is therefore a strategy through which typology can remain coherent even when it loses referential power. Read through the rubric of scientific objectivity, the body’s abstraction into types here, prompted by a shift to a more objective version of science, is not a regression into the nineteenth century but the mark of modernity—the means by which naturalism helps to produce modernism.

II. Camera Work: Vision and Female Objectivity

Just a moment ago I dismissed the idea that “the body of a coquette” was visualizable. Vision lies, I said. Yet of course visualizing the body of the coquette, as a type, is exactly what the nineteenth-century traditions of physiognomy and anthropometrics tried to do. Cesare Lombroso’s influential *La Donna delinquente* [*The Criminal Woman*] was first published in Italian in 1893, the year that Stein entered Harvard. Moreover, anxieties about the potential for dissonance between the visible body and its “true nature” were far from rare; indeed they were rampant—Nana, the “blonde Vénus” who is revealed as black earth,²¹ is only one example of it, and these anxieties were not rarely but conventionally troped in the terms of racial passing.²² In *Nana* we saw the woman made into an object of science and, simultaneously, obsessively spectacularized. The body of the woman in particular was figured as maddeningly unknowable, as in the case of the coyly titled “Femme sans nom” [“Unnamed Woman”], that is, the prostitute, described in the famous July Monarchy series of popular sociological sketches *Les Français peints par eux-mêmes*:

What name can we give to this type so rich and so miserable, so poetic and so abject, so moral and so repulsive; a living enigma that neither scientific research, nor the attentions of charity, nor the efforts of intelligence can illuminate? Already for a long time this woman, in which all devoutness and all baseness, all delicacies of passion and all corruptions of the soul are embodied, has been the study of [*se dérobera à*] the triple investigations of science, religion, and morality; she remains nonetheless one of the greatest

mysteries of the human heart and of social necessity. (245)²³



Figure 1. “La Femme sans nom,” from *Les Français peints par eux-mêmes* (1840), rendering the prostitute as a visually identifiable type (244).

As we saw with Nana, the “femme sans nom” is thus imagined as the great focus of (male) scrutiny and the very thing that most baffles it, the unseeable spectacle that “se dérobera,” literally strips, before the triple gazes of science, religion, and society, who is fully visualized, indeed, “painted” [*pein(t)*] (Figure 1) and yet remains fundamentally incoherent.²⁴ Nineteenth-century typology thus tries to make the visible body legible, and is threatened by the inevitably dissonant or unreadable body. This is not new; the tension between type and instance is a central productive force of the naturalist novel. Indeed, we may understand literary naturalism as an energetic narrative pressuring process through which the human body is made to manifest its truth, as Nana finally does as she succumbs to disfiguring smallpox. “Elle est changée,” Rose Mignon repeats over and over in Nana’s last moments, but the joke is that Nana is not “changed” at all, but simply revealed herself as diseased, the infectious “golden fly” that she always was. Reading “Melanctha” in the same tradition, as I have argued the text invites us to do, suggests that Melanctha’s death is

similarly the consummation of her constitutive malady. But unlike Nana's death scene, which is as intricately staged as *La Blonde Vénus* and gruesomely visualized (Zola sent a friend to the hospital for details),²⁵ Melanctha's death is incredibly abrupt and entirely *unvisualized*. The story ends, "They sent her where she would be taken care of, a home for poor consumptives, and there Melanctha stayed until she died" (239). The body is made to manifest no visible proofs.

But then, Melanctha's body was never visualizable in the first place; instead it was "half made with real white blood," mechanically composed out of genuine (invisible) ingredients. Thus Milton A. Cohen's observation that Stein's medical school experiences delivering babies in Baltimore failed to "serve as an empirical check on Stein's theories of bottom nature" is, at least in one sense, spot on (119).²⁶ Abstract typology rules in Bridgepoint; more precisely, it *rules visuality*. A visible body in "Melanctha" (and elsewhere in *Three Lives*) is always first and foremost an abstracted body; to say that Melanctha is "pale yellow" does more to figure her race (with the associated stereotypes, in this case, of the tragic mulatta) than it does to describe her visually; "pale yellow" is not, after all, an actual skin color, but rather a convention for naming a racial category.²⁷ As Cohen shows, almost no one, down to the most minor characters (e.g. John the coachman), escapes color-coded racial stereotyping—descriptions that *invoke* the visual by using color-words, but that in fact *replace* the body's visible surface with its abstracted racial and characterological type. Linguistically, we may notice, this is achieved not only through visual cues that are always primarily racial cues, but also through the repetition of those cues. Stein's use of repetition has been discussed at length, often brilliantly; Stein herself would later point to repetition as the stereotype by which she was conventionally parodied in the press ("Portraits" 288). Here, repetition reveals character because it produces abstract racial types.

As Bill Brown has powerfully argued, a similar abstraction is gruesomely enacted on the body of the black laboratory assistant Henry Johnson, the title character of Stephen Crane's 1898 novel *The Monster*. With his entire face burned away in a fire, Brown suggests, Henry Johnson is abstracted into the repeatable and repetitious figure of modernity, "where radical embodiment exists as (unnegotiated) disembodiment, where particularity surfaces as a totality of absence: 'no face'" (221). Brown deftly shows that it is no accident that this figure of abstract modernity is black; I would argue further that it is no accident that he is an assistant to a research-oriented doctor. We have already seen in the previous chapter how Claude Bernard imagined the (class-bound) laboratory assistant in his *Introduction à l'étude de la médecine expérimentale* as a kind of human machine, and therefore a guarantor of scientific objectivity. Bernard's class biases are clear; indeed, as Steven Shapin and Simon Schaffer have argued, class has long implicitly underwritten what comes to count as a scientific fact in the first place (66). What we must bring alongside class in order to understand the operation of abstraction in "Melanctha" are the categories of race and gender, for Bernard's experimental scientist was also implicitly white and explicitly male. What happens when the scientist is black? What happens when the scientist is a woman? Is the "unnamed woman" still unvisualizable? Can science proceed? Can it remain objective? If, as Maria Farland has persuasively argued, "[f]or Stein,

experimental authorship models itself on experimental science,” then we need to think about how a female scientist might approach the objectivity that guaranteed science—objectivity that was already conceived in raced and gendered terms.

Farland shows that Stein’s experimentalism was influenced not only by her work at the Harvard Psychological Laboratory but also, and crucially, by her experiences at the Johns Hopkins Medical School, where Stein’s supervisor, Franklin P. Mall, “single-handedly transformed medical training by inaugurating hands-on dissection and independent observation,” effecting “a dramatic shift from a descriptive to an experimental” medical pedagogy (134, 120).²⁸ It was there that Stein developed her self-described “reputation for original scientific work” (ABT 82), yet as Farland also points out, the status of Stein’s work there was fraught, in part because the *practice* of experimental science within the medical school was not only changing but also gendered;

paradoxically, in professional terms, the detailed manual labor and repetitive diagramming that Stein and [her colleague Florence] Sabin²⁹ performed consigned them to the lower end of the manual-mental hierarchy. As Stein was reported to have pointed out, brain modeling was viewed as “purely mechanical work” performed primarily by female students and assistants; by contrast, “the men wouldn’t waste their time on it.” Stein herself dismissed the brain models and diagrams as an “excellent occupation for women and Chinamen”—an astonishing comment that further underscores the association of the production of models with the realm of manual labor. (123)

Although, as Lynn M. Morgan notes, “there were contradictory attitudes regarding the prestige attached to modeling” the brain (“Embryography” 311n5), the “invisibility” of female scientific labor generally has long been a theme of feminist history and philosophy of science; women’s scientific labor, precisely because it was done by women, frequently did not count as scientific labor.³⁰ Farland productively renders the problem in terms of a gendered manual/mental or concrete/abstract dichotomy, drawing on the gendered type-variation theory that was so prevalent in that milieu (but which, as Farland points out, was being challenged by Mall’s research). The theory of variability held that women tended to be “true to type” while men were more likely to “vary”; “[v]ariability’s advocates asserted the female adherence to type—the alleged female tendency toward repetition, habit, and routine—and the male’s greater variability—an alleged capacity for innovation, discovery, and genius” (Farland 118). Given Stein’s engagement with the theory of variability, it makes sense to read Stein’s work through this concrete/abstract dichotomy of mental labor. Related work in science studies, however, suggests triangulating these engagements with the concept of objectivity as well. Stein’s scientific work, as I have argued, prompts questions of objectivity, both in the early collaboration with Leon Solomons—an enterprise of “questionable objectivity,” as Will points out—and in “Cultivated Motor Automatism” (24). But I also wish to examine the role of objectivity in the scene of science perhaps less because it offers solutions than because it is the locus of an interesting problem: the contradiction between gendered knowledge and gendered work. Because objectivity has

often been taken to be the defining feature of science, feminist historians and philosophers of science, most notably Evelyn Fox Keller, Donna Haraway, and Sandra Harding, have argued that the invisibility of women in science has depended on the construction of femininity as by definition subjective and incapable of objectivity, whether because (as in the psychoanalytic model espoused in Keller's landmark essay "Gender and Science") girls are actually developmentally disposed not to make sharp subject-object distinctions or because (as in Michèle Le Doeuff's reading) such an incapacity is merely attributed to women by a patriarchal society invested in defining the male as "the sex of knowing."

As Naomi Oreskes has trenchantly observed, the case of the women scientists in Stein's position troubles the question of objectivity, since their work was in many ways exemplary of the values of objectivity. "Broad historical generalizations are risky," she writes, "but, if anything, it appears that women in American science have been characteristically employed not in jobs that required a high degree of emotional involvement or contextual judgment [what feminist historians have called "situated knowledge"], but precisely the opposite," especially "highly quantitative analytical and numerical work" (89).³¹ In contrast with the objective scientific labor that was, as Oreskes points out, *typically* assigned to female scientists, there is an almost exclusively masculine tradition of "auto-experimentation"—experiments performed on oneself—that mobilizes heroic narratives in which "the auto-experimenter is portrayed as smarter than those surrounding him, possessed of an emboldening insight lacking in his colleagues," even though "the epistemological value of most auto-experiments...is certainly questionable" (106-7)—as questionable as the objectivity of the auto-experimental "Normal Motor Automatism," in fact. Examining the work of women scientists of the early twentieth century, Oreskes suggests that, contrary to dominant narratives of the role of gender in science, the exemplary agents of objectivity in the lab are not men but women.

Stein's work was not quantitative analysis but rather brain modeling, associated less with clerical work than with "descriptive morphology" and natural history illustration (Farland 123). The underlying principle, however, is similar. Intellectual work that might be considered highly "objective," and therefore genuine science, could also be considered purely mechanical, hence not really intellectual work at all. Indeed, mechanical work could potentially be framed as not even work. Stein herself described her brain sections as "purely mechanical work and rather restful," mechanization eliding the distinction between work and leisure (qtd. in Schoenberg 251). It is worth pausing for a moment to note that this tension has long marked discussions of science in general, so that science could easily oscillate between being what the Paris monument to the cell biologist François-Vincent Raspail names "la seule religion de l'avenir" ["the only religion of the future"] and what Edgar Allan Poe termed "dull realities"; thus the scientist has been stereotypically represented as either a mere technician or the full embodiment of Romantic genius. Science's strength—its purchase on reality—simultaneously threatened its status as intellectual work; the contradiction in the reception of the work of women scientists thus also lies in the reception of science itself.³² Women's marginal role in the historically delineated institution(s) called "science" poses a further problem, for the gendering of

science (as masculine) must be distinguished from the gendering *within* science, in the division of labor here pointed out by Farland, Morgan, and Oreskes. But Oreskes's point is that the characterization of science as both "objective" and gendered masculine must also be distinguished from the characterization *within* science of different kinds of labor, some "masculine" and some "feminine," where "objective" no longer maps neatly onto "masculine" but, on the contrary, best describes the less-valued labor of women.

The problem comes into greater focus when we consider what is meant by "objectivity" here, especially with respect to "mechanical" labor. What Lorraine Daston and Peter Galison call "mechanical objectivity" (in contrast with "aperspectival objectivity" or "structural objectivity," for instance) is the kind of objectivity that specifically relies on mechanical processes to strain out human intervention. Mechanical objectivity became an important scientific value in the mid-nineteenth century (Claude Bernard offers a good example), and its values are deeply tied to the idea of labor. Objectivity, for Daston and Galison, is always the suppression of some version of subjectivity; here it is an inconsistent and willful self that must be regulated. "By *mechanical objectivity*," they write, "we mean the insistent drive to repress the willful intervention of the artist-author, and to put in its stead a set of procedures that would, as it were, move nature to the page through a strict protocol, if not automatically. This meant sometimes using an actual machine, sometimes a person's mechanized action, such as tracing" (121). Where humans were fallible, "patient, indefatigable, ever-alert" machines would take up the burden with their exemplary virtues of labor. "Of course," Daston and Galison note, "strictly speaking, no [moral] merit attached to these mechanical virtues, for their exercise involved neither free will nor self-command. But the fact that the machines had no choice but to be virtuous struck scientists distrustful of their own powers of self-discipline as a distinct advantage. Instead of freedom of will, machines offered freedom from will" (123). In such a context, Stein's shocking comment about brain modeling—that it was "excellent occupation for women and Chinamen"—comes into focus as the articulation of parallel stereotypes about women and about Chinese workers, both of whom were easily read as automata of one kind or other in discourses of the period, lacking "powers of self-discipline" and *therefore* exemplary workers. As scholars of Asian American history have observed, the east Asian and especially the Chinese worker resonates here as the exemplarily mechanized laboring body. The female scientific laborer is represented less as a scientist than as a technician, less experimenter than experimental instrument.³³ Joining a long tradition of female scientific illustrators, she is made into a human camera, valuable less for her discernment than for her mechanical lack thereof.³⁴ By taking a picture of nature, she disappears from view: camera work.

It is worth taking a moment to try to align science historians' accounts of mechanical scientific labor with literary critics' accounts of modern mechanical labor, for together they help to articulate the interface between science as such and supposedly merely ancillary or derivative technology. If, as Daston and Galison have argued, "mechanical objectivity" was the dominant epistemological-moral norm in science in the late nineteenth century, and objectivity was guaranteed by the "blind sight" of unthinking

machines or machinelike people, then the quasi-mechanical scientific labor of women like Florence Sabin and Gertrude Stein not only guarantees the epistemological purity of scientific research as such but also enacts a technoscientific modernity.³⁵ As Colleen Lye explains of “mechanical” Chinese labor in this period,

The ‘yellow peril’ discourse of a coming modernity...switches the way in which the dichotomy between primitive and modern is typically racialized such that the temporal hierarchization of Self and Other is reversed or abolished. In a sense, the historical emergence of Asiatic racial form can be read as the appearance of the otherness of Western modernity to itself. In the literature of naturalism, the brute is typically a kind of ‘wild man,’ desire incarnate loosed from social control, denoting the figure of primitivism within modernity. The coolie signifies a different kind of monstrous presence, not the ambivalent pleasure of the body’s libidinal release, but, on the contrary, the prospect of its mechanical abstraction. Its articulation to historical processes of mechanization helps explain the sense of Asiatic labor’s inevitability.... (56)

As Lye points out, the atavistic brute of naturalist literature is usually temporally marked by pastness, figured in the terms of popular Darwinism as animal. The Chinese-worker-as-machine, by contrast, signifies the future of labor—abstracted, mechanized, modern. And the “pale yellow” Melanctha, as I have indicated, is similarly abstracted to a racial type—one that is, in the context of the figure of the “Chinaman,” momentarily destabilized: “yellow” and “brown” were also names used to figure Chinese and Japanese people, respectively (Lye 16). It is not that Melanctha is in any way represented as Asiatic (she is not), but rather that her somatic typing calls on a discourse of the period that similarly abstracted bodies in terms of labor.

There is, I would hasten to add, a difference in principle between the abstraction that makes Melanctha an unvisualizable type and the abstraction of the mechanized worker. What I am arguing is that in “Melanctha” these two types of abstraction are conflated, because the repetition that reveals the bottom nature, as so many critics have noted, also propels the narrative forward, constituting the labor of Melanctha’s knowledge-gathering “wandering.” Formally, to be a typed object of scientific scrutiny, “half made with real white blood,” is also to be a repetitious wanderer, acquiring knowledge. Indeed, even the acquisition of knowledge for Melanctha is a doubled activity; knowledge is indivisible from sex, as Melanctha at first “trie[s] to learn the ways that lead to wisdom” from various men, and then begins “to see very clear” as a result of her intense affair with Jane Harden (137, 139). And thus to gather knowledge, for Melanctha, is simultaneously to become the threatening figure of the sexually experienced woman, the “femme sans nom” who disrobes before, and yet baffles, the triple gaze of science, religion, and society. Gathering knowledge, she becomes knowledge’s object.

“Melanctha” thus helps us see the ways that female labor³⁶ is figured as repetitious, mechanical, and modern. Melanctha’s mechanicity is part of the narrative of modernity; the “machine-woman,” in Andreas Huyssen’s term, was a trope that arose “as soon as the

machine came to be perceived as a demonic, inexplicable threat and as harbinger of chaos and destruction,” perhaps most famously in Fritz Lang’s 1927 film *Metropolis* (70). In the realm of modernist poetry, T.S. Eliot in 1922 would offer a typist, a recorder of others’ words, whose famous “automatic hand” mimics the arm of the gramophone on which she places yet another recording (l. 255). Yet the modern machine-woman appears in the lab as well; the “typewriter”—a female worker of the period named by the machine she operates—is the business-world analogue of another kind of (typically) female worker, the “computer.” As David Alan Grier explains, before computers were machines they were people, typically women, whose work crucially enabled scientific research, especially in astronomy and physics, as early as the seventeenth century. The “ingenious” Leslie John Comrie, credited as “a pioneer in scientific computation” (Massey 97, 101) made his much-lauded strides in the 1920s by employing cheap female labor. “Almost all of Comrie’s human computers were young, unmarried women” (Campbell-Kelly and Aspray 58). Indeed, the work of these human computers was part and parcel of Comrie’s larger (and essentially managerial) project of streamlining and automating scientific calculation, which involved not only repurposing a female labor force but also repurposing machines “such as the National machine and the Hollerith punched card equipment, for computational purposes far beyond the minds of the original designers of the machines” (Massey 99). Thus the female scientific “computer” was mobilized at the same time, in similar ways, and to similar ends as the early machine computers. Yet as Oreskes reveals with her case study of Eleanor Lamson—who was included in the 1927 edition of the ironically titled *American Men of Science*—women who were hired as “computers” were not necessarily engaged in machinic or automatic tasks, but in scientific research per se (91). Just as Christopher Keep and Pamela Thurschwell point out for the typewriter, the reality of the computer did not necessarily map accurately onto the narratives by which she was described (or for which she was, for that matter, paid). This consideration does not, however, negate the power with which an allegedly machinic and unthinking female worker might come to signify a specifically scientific modernity.³⁷

Yet it is important to note that, at least in modernist narratives of femininity, the unthinking (primitive) animal of naturalism and the unthinking (modern) machine-woman are not so much opposites as translations of one another. It is in this context that we may understand Melanctha’s position as both the abstracted “femme sans nom,” subject to diagnosis, and an abstracted female knowledge worker. Phillipe Auguste Villiers de l’Isle-Adam’s 1886 novel *L’Ève future* [*The Eve of the Future*, or *Tomorrow’s Eve*] sets up the American inventor par excellence, Thomas Edison, as a translator between the two archetypes, revealing their continuity. Edison sets himself the task of understanding the Eve-like *femmes fatales*—chorus girls and prostitutes—who evidently riddle major metropolises, posing a dire threat to masculine integrity and public order. Like Zola’s Nana, and diagnosed much as the journalist Fauchery diagnoses Nana, such women are animals, innocent insofar as they are not self-aware but poisonous all the same. Yet as Edison describes them to his friend Lord Ewald, the *femme fatale* is not only an animal,

“less distant, in REALITY, from the animal species than from our own” (258) and a monstrous “vampire” (259) but also a technician, a sort of natural machine.³⁸

Look: the bee, the beaver, the ant do [font] marvelous things, but they do nothing else, and have never done anything else. The animal is exact; birth confers upon it, with life, this fatality. [...] The Animal does not err, does not oscillate! Man, on the contrary (and it is this which constitutes his mysterious nobility, his divine election) is subject to development and error. He is interested in all things and forgets himself in them. (255-6)³⁹

What Marianne Moore would later celebrate as “unconscious fastidiousness” is here the mark of monstrosity, indeterminately either animal or machinelike, but in any case unconscious, hence incapable of human nobility or human error. The woman as object-of-scientific-scrutiny is herself an engineer. Villiers’s Edison thus logically reinvents the vampiric female animal as the “Eve of the future,” the android Hadaly, literally automating unconscious fastidiousness and re-rendering the chorus girl as the docile commodity-cum-worker she was always meant to be.⁴⁰

Thus, as Rita Felski puts it, the “metaphorical linking of women with technology and mass production” positions the woman, like the Chinese laborer, as a figure of (terrifying) modernity—specifically, for the mechanical chorus-girl as for the mechanical type-writer, a figure of modern work (20).⁴¹ Writing of a “fastidious ant”—one of the creatures to which Villiers compares the *femme fatale*—that “carr[ies] a stick, north,/ south, east, west, till it turn[s] on/ itself,” Moore asks, “[w]hat is/there [...] in proving that one has had the experience of carrying a stick?” (ll. 22-4, 28-32). Moore poses the question with apparent sincerity, but whatever there is in such an exercise, its status as *work* is certainly in doubt, not only because the repetitive closed loop of the ant’s circuit plugs a zero into the Newtonian formula of force times distance but also because the ant’s fastidiousness is unconscious. It does marvelous things, but it does nothing else, and has never done anything else: dropping the stick and picking up something else, “it [goes] again through the same course of procedure” (l. 28). The unconscious work of the ant, like the unconscious work of the woman whose automatic writing is the object of scientific scrutiny, is the production of raw data that must then be interpreted by poet or scientist. Yet when, as according to the norms of mechanical objectivity, raw data is precisely what must be obtained, then the unconsciousness of ant or woman is the necessary guarantee of the data’s value. It is not unexpected, then, that as Kittler argues in *Gramophone, Film, Typewriter*, the woman’s mechanicity is precisely what makes her valuable as a typewriter or stenographer. The woman-as-machine acts as an ideal amanuensis for nature, the interpreter who does not interpret but merely reveals. Figured as machine-like, the woman scientist has all the virtues of objectivity that the male scientist, “subject to development and error,” lacks; working in a laboratory, she is thus both the guarantee of scientific integrity and the herald of a technologized, fully automated modernity—the first step, Gertrude Stein might say, out of the nineteenth century and into the twentieth century in literature. Automatic writing, natural product of hysteria, returns during Stein’s time in medical school as the unique feminine contribution to the science of neuroanatomy.

Yet the issue of automatic writing flags again for us the ambivalent status of the woman in the laboratory, for while Stein did research on brain anatomy in medical school and on motor automatism in college, she was also an experimental subject for the college experiments, and the former laboratory role, as *L'Ève future* suggests, at times collapses into the latter. Anticipating Villiers by two years, Stein, strikingly represents the female experimental subject as a machine-woman in an 1894 lab report:

[T]his vehement individual is requested to make herself a perfect blank while someone practices on her as an automaton.

Next she finds herself with a complicated apparatus strapped across her breast to register her breathing, her finger imprisoned in a steel machine and her arm thrust immovably into a big glass tube. She is surrounded by a group of earnest youths who carefully watch the silent record of the automatic pen on the slowly revolving drum.

Strange fancies begin to crowd upon her, she feels that the silent pen is writing on and on forever. Her record is there she cannot escape it and the group about her begins to assume the shape of mocking fiends gloating over her imprisoned misery. Suddenly she starts, they have suddenly loosed a metronome directly behind her, to observe the effect, so now the morning's work is over.

(qtd. in Raine 808)

As Anne Raine points out, Stein stages this episode as “a gendered competition between internal and external perspectives” in which the female subject is “imprisoned...by the reduction of ‘this vehement individual’ to pure bodily phenomena” (809). But what is most important in this gendering, I would argue, is the way in which it the woman in the laboratory is *simultaneously* “pure bodily phenomena” (as Raine puts it), “an automaton,” and a (female) worker—just as the objects of Edison’s scrutiny are workers. By being made into an object of science—here specifically the science of consciousness, experimental psychology—the woman is made into “an automaton,” broken into her component parts and “surrounded,” her sexually identificatory breast bound up in “a complicated apparatus.” The woman in the lab, here as an experimental subject rather than as a researcher, is conscious of her unconsciousness as she engages in automatic writing that she cannot control, her “normal motor automatism,” a mindless work of endless output from an “automatic pen” onto a “slowly revolving drum.” Here the participation of the experimental *subject* is figured as labor, “the morning’s work,” but an unconscious labor—the automatic inscription of “her record” in an action parallel to that of the (allegedly) unthinking typist. Indeed, as Raine observes, Stein does not challenge the validity of the experimenters’ knowledge so much as simply register its distance from the experimentee’s subjective experience; although there is a gendered bifurcation of experience in the lab, Stein does not exclusively endorse either one (809). This serves as a reminder of the way that Stein herself moved between acting as the woman experimenter and the woman experimentee, each of which is, by this account—problematically—a kind of scientific worker. In other words, when conceived as a worker, the quasi-automatic female scientist is

precariously close to the automatized experimental subject. As we saw, Stein indeed occupied both those positions in her research with Solomons, published in the same year as *L'Ève future*. What her 1894 lab report reveals is the way in which objectivity—conceived as separating the knower from the thing known—is rendered figuratively impossible for the woman integrated into a structure of “work” that depends on automating her body. The woman-as-objective-scientist is always in peril of being read as woman-as-object-of-science, and her success at the self-restraint that constitutes mechanical objectivity does not therefore work to separate her from the thing-known so much as help make her *into* a thing, a living scientific apparatus. If, as Oreskes argues, the scientific value of objectivity is countered by the value of heroism, what Daston and Galison’s account of objectivity suggests and a survey of the discourse surrounding women’s paid work in the early twentieth century corroborates is that objectivity *per se* always already depends on a heroism, the heroic suppression of a (masculine) willful self (Daston and Galison 176), without which crucial ingredient objectivity stops being objectivity and risks becoming objecthood.

Thus the woman scientist is “invisible” because her labor is figured as mechanical, and therefore, at least in Stein’s phrase, capable of being re-read as “restful” non-work. Indeed, the narrative of mechanicity rendered that work capable of being non-*read*, as in an incident that Meyer, Farland, Morgan, and Schoenberg have analyzed in some detail. A minor controversy over whether some of Stein’s work deserved to be published in the *Journal of Anatomy* centered on a question of whether it was “original” research or merely (unoriginal, copied from nature) data.⁴² The work was not published; thus, outside the private exchange of letters between Llewellys Barker and Henry McElderry Knower, it never appeared as work at all. Stein’s paper, the subject of Barker and Knower’s exchange, is lost. The woman scientist as such disappears, leaving only an apparatus—a protocol, the guarantee of objectivity. Thus the threat of objectivity is perhaps not its tendency to be overshadowed by narratives of heroism in the wider public sphere, as Oreskes suggests, so much as the way that performing objectivity risks rendering oneself an object—a dangerous maneuver for a class already prone to objectification.

III: Black Earth: Wandering and Objectification

Stein left medical school in 1902, a year before she wrote *Q.E.D.* Meyer argues that Stein soon “exchang[ed] a practice rooted in James’s physiological psychology and his subsequent research on ‘extraordinary mental states’ ... for a practice more akin to the poetic science of Emerson and Whitman,” one that resembles D. H. Lawrence’s “subjective science” (55). The oneiric terror that suffuses Stein’s 1894 description of research at the Harvard Psychological Laboratory certainly makes such a reading plausible. But a reading of *Q.E.D.* and especially “Melanctha” suggests an interest in what Jennifer Ashton has called “a mathematical independence from experience as such” (28). Like Ashton, I read in Stein’s career a “logical turn,” a turn to an abstract *lingua characterica*, but I locate this turn earlier in Stein’s career, and I see it as less of a break with Stein’s scientific training than as

a working out of that training to its logical—perhaps naturalist—consequences.⁴³ Stein breaks with empiricism, radical or otherwise, but not with the objectivity that she increasingly manifested in her scientific work, objectivity that led to her work, as late as 1902, being dismissed as insufficiently original.

Another incident of 1902, considered particularly compellingly by Lynn M. Morgan, brings Stein's objectivity—and the ways that objectivity could be particularly problematic for a science of the visual—into clearer relief.⁴⁴ Stein failed to graduate with her class, but was offered the opportunity to recuperate her medical degree by undertaking an extra project in the sectioning and modeling of an embryo brain.⁴⁵ Meanwhile, Florence Sabin, Stein's colleague and the soon-to-be first woman professor of medicine at Johns Hopkins, "set the standard against which [Stein's work] was judged" (Meyer 85). When Mall found Stein's work unintelligible, he consulted Sabin, who had recently completed her *Atlas of the Medulla and Midbrain*. As Sabin later recounted to a colleague, "I soon found out that she had bent the spinal cord of the soft brain forward, so that it protruded just under the frontal lobes before fixation, and that accounted for the strange and bizarre course of the tracts in her model" (qtd. in "Embryography" 315). Morgan's gloss on the episode helps us understand what, practically, the error entailed:

Strange anatomy indeed. Stein had twisted the brain stem before the soft brain was fixed. Imagine, for a moment, what this entailed. Someone, likely Stein herself, had been sent to the cold storage room where Mall was building a collection of hundreds of late-term fetal and infant cadavers for use by the medical students. Someone would have had to cut open the skull and remove the small brain, which if it were fresh would have been surprisingly malleable, the consistency of soft butter. Perhaps someone shuddered. Perhaps someone squeezed the delicate brain or dropped it on the floor. (Stein was, by all accounts, notoriously clumsy.) By the time someone fixed the brain in a solution of formalin, it had been mangled, but the error went unnoticed. Someone cut the distorted brain into sections and painstakingly build a model that turned out to be nonsensical and wrong. ("Strange Anatomy" 20)

Mall and Sabin discarded the whole project, ending Stein's last prospects for a medical degree. I do not suggest that Stein should have been awarded the degree, nor that hers was necessarily a good model. Rather, I wish to point out that it was objective—indeed, that Sabin and Mall discarded it because it was *too* objective. That Sabin was able to reconstruct the problem suggests that the model was not "fantastic," as Stein's classmate Dorothy Reed Mendenhall later reported, but rather an all too faithful representation of a damaged, hence atypical, specimen (qtd. in Meyer 85). Or rather, as Mendenhall herself seems to register, what was "fantastic" about the model was the fantastic quality of the specimen itself. A guiding principle of mechanical objectivity was to " [l]et nature speak for itself," which "tended...to shift attention to the reproduction of individual items—rather than types or ideals," even if those individual items were "inevitably flawed" (Daston and Galison 121, 151)—hence the objective scientist's use of machines like the camera, and,

through heroic self-suppression, his emulation thereof. So far as we know (for again, the actual work is lost), Stein's model of the brain, far from being "fantastic" or subjective, machinically enacted the values of mechanical objectivity. Sabin's recently published *Atlas of the Medulla and Midbrain* offers a contrasting case, as one reviewer, describing one of Sabin's drawings, indicates: "[a] picture like this conveys a better idea of the convolutions of this body than can be obtained from a study of microscopical sections" (qtd. in Meyer 86). Sabin's clarifying and typifying representations of the brain mediated the messy contingency of actual microscopical sections, rendering them intelligible. Sabin's goal as an atlas-maker was not to represent a particular specimen exactly as it was so much as to provide a schema according to which specific specimens could be understood. Although Mall's pedagogy, praised by Stein in *The Autobiography of Alice B. Toklas*, emphasized the "hands-on," his most successful protégée, Florence Sabin, produced a pedagogical tool that registered and ameliorated the limitations of that very pedagogy—an atlas that could mediate and make sense of individual specimens (ABT 81).⁴⁶

I wish to avoid a too-simplistic binary here. It would not be accurate to suggest that Stein was objective and that Sabin was subjective, or that Stein was somehow the "better" scientist (in that slippage that equates objectivity with scientificity). For one thing, it is not illuminating, I think, to turn the history of science into a turf war. More importantly, the historical evidence would not support such a conclusion: Sabin, too, was an adherent of objectivity. Several of her illustrations are carefully labeled tracings of sections prepared by John Hewetson; by tracing the sections, Sabin subordinated her judgment to the particularity of the specimen (Sabin 121; Figure 2). The tracings are mediations, of course, but they nonetheless seek to "let nature speak for itself." Moreover, Stein was evidently also a schematizer, or so she represented herself (whereas Sabin's illustrations are still widely available, Stein's are lost).⁴⁷ There is no evidence to suggest that Stein's drawings were *stylistically* different from Sabin's (though by some accounts they were less competent). What makes Stein's work more "objective" (in the technical sense described by Daston and Galison) than Sabin's is her willingness to copy the specimen before her, whatever the condition of the specimen, declining (or, less charitably, unable) to correct or stylize by accounting for (discounting) a bent-back brain stem. Sabin's well-received atlas served as a visual aid that helped to impose legibility on a notoriously complicated region of the body. These drawings refer not only to specimens but also to other drawings; a number of Sabin's illustrations are denoted "after Barker, L. F.: The Nervous System and its Constituent Neurones" (121), just as many of Barker's illustrations in *The Nervous System and Its Constituent Neurones* are "after" the drawings of other anatomists. This evidently widespread practice points to the ways in which visualizations of nature constantly had to be checked against *one another* as well as against specimens. Modeling the brain entailed building a communal consensus about what those models could look like. To censure this work as "subjective" would be to suppose that there necessarily existed in nature, and in every specimen, clearly defined objects that could be called the "inferior olive" or the "nucleus of Darkeschewitz" prior to their modeling and definition according to particular disciplinary norms. Stein's model of a brain with the brain stem bent back was objective, yet also,

because it was not intelligible in those terms, “fantastic.” My point here is not that Sabin was (regrettably) a normalizer and Stein (virtuously) objective, but rather that Stein was, by the end of medical school, beginning to push her objectivity beyond the norms of her discipline—not retreating from objectivity but exploring it further.

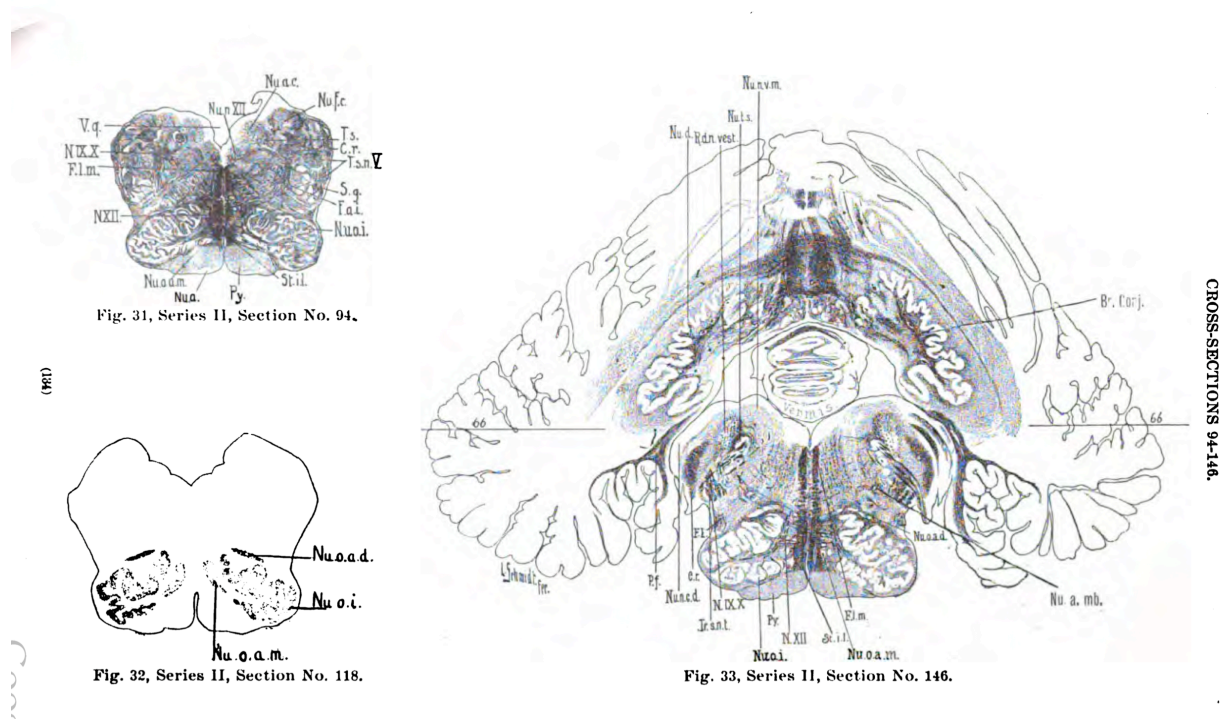


Figure 2. From Florence Sabin, *An Atlas of the Medulla and Midbrain* n.p. From a “[s]eries of transverse sections passing through the medulla, pons, and midbrain of a newborn babe. The series is traced from the spinal cord toward the cerebrum.” Figs. 31 and 33 are “after Barker” (Sabin 121).

Stein’s insistence that she *did* conform to the norms of her discipline both trouble and illuminate this account of objectivity in her work. In the controversy over whether her work might be published in the *American Journal of Anatomy*, Stein’s final words on the subject—delivered immediately prior to leaving for France—curiously characterized her research as precisely the opposite of what her harshest reviewer, Henry Knowler, deemed it to be. Knowler wrote to Barker that Stein’s paper contained excellent raw data that had not been adequately analyzed. It seemed to him “unfinished, and lacking in constructive thought,” and that the paper consisted primarily of “data” that needed to be “sifted more and worked up into a new or better mental picture” (Knowler, 9 April 1902). In other words, as I have described above, Knowler viewed Stein’s paper as lacking in originality or critical thought, though rich in mimetic detail merely copied from nature. Stein’s

representation of her work strikingly inverts Knowler's critique; *instead* of providing new data, she suggests, it provides new and clarifying analysis:

The whole point of the adult [brain] series to me is not so much/that there is very /definite new| material although there is some of that but| that as far as XXXXXX XX/XX I have been able I have endeavored to expres[s]/a very clear image which exists in my own mind of a region which the existing literature of the subject leaves in a hopeless mess..My drawings are of course very much more diagram[m]aticXXXX than [Swiss anatomist Rudolph Albert] Von Kolliker's but it seems to me that they tell a clear story. [...M]y aim in writing this article has been not so XXXXX much to give/new/matter but to make confusion clear.

Lacking reference to the original work, it would be difficult to arbitrate between these two opposing accounts. What is striking about them is their complementarity,⁴⁸ although as Meyer rightly observes, Stein's aggressively typo-ridden letter, ironically declaring the clarity of her work in flamboyantly unclear typography, performs something beyond what it says, suggesting, for instance, a message to Barker "that he and his kind can go to hell" (101)—or, to put it in less oppositional terms, that she is not invested in whether her research is published (see Figure 3). Yet Stein's account seems to have something in common with Knowler's—the idea that a "mental picture" is the form that knowledge takes. Given that a substantial portion of the work—"some manuscript and sixty-three drawings" (Knowler, 7 April 1902)—was *physical* pictures, literal images, it is curious that both Stein and Knowler emphasize *mental* images. Whereas Knowler claims that the paper lacks "a new or better mental picture," Stein asserts that her work is the product of "a very clear image which exists in my own mind."⁴⁹

220 East Eager Street.

Baltimore W, Md

My dear Dr. Earker,

I have just received your note and hasten to answer it

I will not be able to do any further work on the paper that I have
 sent to you as I am going abroad for an indefinite period. Furthermore
 I feel that I have done all that I can with it so I will willingly
 leave it in your hands to do with as you like. My personal opinion
 of its value is as follows. The embryological series are of value as
 showing conditions at a certain stage but their chief value to me was
 that they enabled me to understand the adult series that I finally
 made. The whole point of the adult series to me is not so much that there
 is very definite new material although there is some of that but that as
 far as I have been able I have endeavored to express a very
 clear image which exists in my own mind of a region which the existing
 literature of the subject leaves in a hopeless mess. My drawings are of
 course very much more diagrammatic than Von Kolliker's but it seems to
 me that they tell a clear story. They clear away the underbrush and leave a clear road. I had so
 much difficulty in understanding the conditions from the text books that
 I felt such a clarifying process to be much needed. Not that the books
 do not all tell the truth as I know it but that they tell so
 much more that one is confused. By my series of recapitulations
 and a pretty careful selection of sections I felt that I had to a certain
 extent accomplished this. Of course of such a matter I am not the best

judge but my aim in writing this article has been not so ~~much~~ much to give ~~new~~ matter but to make confusion clear. I do not feel that Dr. Knower is a good judge of this matter because he does not know the region and its confusion. My object has been to save the next man from a long preliminary work. ~~is~~

As I have said I will not have the time nor do I feel that I can make many changes. I have done with it all that I can and the rest must remain with you. I do not expect to do any neurological work for some time to come. In bidding you good by I want to thank you for your many kindnesses and to hope that my work will be of some service to you.

Sincerely yours

Gertrude Stein

Figure 3. Gertrude Stein to Dr. Lewellys Barker (n.d., but evidently 1902). The Alan Mason Chesney Medical Archives of the Johns Hopkins Medical Institutions.

One possible account of the discrepancy between the two opinions is that either Knower or Stein was purely and simply misreading the material at hand. Such an account might suggest that Knower was a sexist or an anti-Semite, or that Stein was an impossible egotist, blinding one or the other to the reality of the work. While none of these explanations is altogether improbable, the evidence for any of them is insubstantial. I would suggest an alternative explanation—that each of them had a different notion of what a “mental picture” might be, what it ought to be doing for a scientific paper, and in whose mind it ought to reside. Each seems to conceive of the mental picture as something arising from empirical experience, drawn from the data at hand. But for Knower, the mental

picture seems to be fundamentally a disciplinary picture, a locus of consensus, whereas for Stein it is evidently a private form of what James would call “knowledge of acquaintance.” We have some sense of what Knower felt would impart the requisite mental picture from Sabin’s *Atlas*, which Knower introduced as “offer[ing] a valuable and new remedy for” certain “difficulties,” namely that “the descriptions [of the brain] in text-books or lectures are commonly so detailed, or so general or diagrammatic; that many students get but hazy ideas of what is shown in their preparations” (Knower, “Editor’s Preface” 5). Sabin’s work succeeds as an atlas because it is neither overly detailed nor overly schematic. Literally a happy medium, it offers enough detail to correlate the overwhelming particularity of the the student’s specimen with a mental picture that is not “hazy” but “clear” (Knower, “Editor’s Preface” 5). The mental picture is something that the atlas can help the student to produce. As Daston and Galison put it, “[f]or initiates and neophytes alike, the atlas trains the eye to pick out certain kinds of objects as exemplary (for example, this ‘typical’ healthy liver rather than that one with cirrhosis) and to regard them in a certain way....The atlases drill the eye of the beginner and refresh the eye of the old hand” (22).⁵⁰ For Knower, the mental picture is both empirical and disciplinary; Sabin’s *Atlas* offers a “new or better mental picture” because it builds a rapport between specimen particularity and anatomical generality. The mental picture, by this account, is enabled, indeed produced, by the physical pictures. This is why Knower could demand that Stein’s submission be “worked up into a new or better mental picture”; the mental picture was conceived as something that could help make the specimen legible to the community and its neophytes.

Stein, in contrast, represents the mental picture as the *origin* of her manuscript: “I have endeavored to expres[s]/a very clear image which exists in my own mind of a region which the existing literature of the subject leaves in a hopeless mess.” The site of Stein’s mental picture, “my own mind,” makes the image less a matter of correlating specimens with a professional visual idiom than of imparting to the community a “diagram[m]atic” schema of Stein’s own knowledge of acquaintance. While Stein, perhaps even more than Knower, is concerned with clarity, her account of clarity is brusque, almost violent, not a matter of managing detail but of sweeping away the “hopeless mess” (as Mall and Sabin did with her model); her drawings thus “clear awaythe underbrush andleave a clear road” (Stein, “To Lewellys Barker”). This represents, I would argue, Stein’s final shift in medical school toward an extreme objectivity, one that no longer attempts to represent specimens as such but rather turns to abstract mental structures, burning away contingency by way of “a clarifming process” and leaving pure structure. While Stein’s knowledge of the brain is rooted in the hands-on work that she did, she conceives its final manifestation as a distilling. Or as the autobiographical Adele puts it in her epiphanic moment in *Q.E.D.*, “‘its like a bit of mathematics. Suddenly it does itself and you begin to see’” (13). Here “see[ing]” is invoked as a metaphor for knowing; the mental picture is no picture at all but an understanding produced by the extreme abstraction of a calculus that “does itself.” Visuality itself cedes to—is subsumed by—ratiocination. Stein’s emphasis on clarity, in her letter to Barker, is striking; “expres[sing]/a very clear image,” Stein’s “diagram[m]atic” images “tell a clear story” as they “clear awaythe underbrush andleave a clear road”; the aim

of Stein's "clarifying process" is "to make confusion clear" ("To Lewellys Barker"). To make such insistent claims for clarity in such a typographically resistant letter (Fig. 2) is not only, as Meyer suggests, to make the social gesture of telling the medical school to go to hell (101) but also to make a writerly gesture toward what critics have pointed to as a central conundrum of modernist writing, that clarity might be achieved only through obscurity.⁵¹

Stein's abstraction in her early naturalist fiction has been examined in detail by a number of critics, perhaps most brilliantly by Jennifer Fleissner, who sees *Three Lives* and *The Making of Americans* as "representing the culmination and final transformation of the naturalist 'compulsion to describe'" (*Women* 254).⁵² The striking formal features of this period are well known: "rhythmic" repetition, the constant invocation of certainty, a thematics of taxonomy, the "continuous present," and a highly stylized syntax. What I hope my account of Stein's scientific work has by now suggested is that the features of this writing—I take "Melanctha" as my exemplar, as so many have done before me—can be theorized in the terms of an extreme objectivity that takes abstraction, or what Alfred North Whitehead calls definition by "intension," as the guarantee of communicability.⁵³ The abstraction of language in "Melanctha" both figures and represents the abstraction of the body, an abstraction that, as a female scientist, Stein had already learned to excessively and parodically enact.

This move toward an objectivity of abstraction is historically intelligible in the terms of what Daston and Galison call "structural objectivity," or what Martin Jay, in another context, has identified as the avoidance of "the specter of psychologism" (93). Structural objectivity is suspicious of the objectivity of empirical data, indeed, of the possibility that experience can be communicated—a concern familiar to readers of "Melanctha." Because the senses are fallible, protocols for collecting data inevitably impure, mental heuristics misleading, and communication imprecise, adherents of structural objectivity—primarily, as Jay has pointed out, at the turn of the twentieth century—turned to the formal structures of mathematics and logic as the only possible guarantors of scientific objectivity. Understanding the values being upheld in this model depends on accepting a distinction between objectivity and scientificity: by moving away from empiricism, some would argue that these very objective thinkers—notably Gottlob Frege, Henri Poincaré, and Bertrand Russell⁵⁴—were moving away from science itself. My purpose here is not to engage the ever-contested question of the boundaries of science but to track how a scientific *value*, objectivity, was pushed to an extreme form that would eventually prove crucial in the development of logical positivist philosophy, computer science, and, as I am arguing, one influential version of experimental writing. To be clear, I am not arguing influence but confluence; what I aim to map in reading the structural objectivity of "Melanctha" is a formal correspondence between Stein's naturalist writing, "as exact as mathematics" (*How Writing* 157), and the work of scientists who hoped to use an objective language to eliminate "the specter of psychologism." The correspondences with Gottlob Frege's *Begriffsschrift* [*Concept Writing*] (1879) are particularly striking, but my aim is not solely to point out similarities. Rather, I take those similarities as evidence that Stein's naturalism is invested in a fairly counterintuitive set of values—Frege wished to banish

psychology; Stein was trained in it, however unconventionally. To align Stein, and especially the Stein of “Melanctha,” with an anti-psychologist like Frege may seem particularly controversial in light of many rich readings of “Melanctha” in the terms of Jamesian psychology (see especially Ruddick) as well as in light of the text’s manifest interest in the “complex, desiring” Melanctha’s interiority (not to mention Jeff’s). Yet this interiority is precisely the point. As Jeff and Melanctha continue to attempt to communicate their interior states, they repetitively reveal and reinforce their own bottom natures, which in Melanctha’s case is her constitutive malady. Psychology here does not counter the closed system but rather produces it. Or as Fleissner puts it, Stein is interested in “refiguring the meaning of the most apparently rigid taxonomization and repetition from within” (302n27). That rigid taxonomization, I am suggesting, is a concept-writing.

Frege’s *Begriffsschrift* represents an attempt to construct a language to communicate ideas unambiguously. We must be careful to characterize this attempt fairly; Frege does not suggest that sense experience is irrelevant. His concern is not with gathering ideas (in which sense experience necessarily figures) but with proving their validity (5). Nor does he entertain any fantasies that his *lingua characterica* is entirely unambiguous, and he explicitly denies that it can or should replace natural language when he compares the *Begriffsschrift* to a microscope:

I believe that I can best make the relation of my ideography to ordinary language [*Sprache des Lebens*] clear if I compare it to that which the microscope has to the eye. Because of the range of its possible uses and the versatility with which it can adapt to the most diverse circumstances, the eye is far superior to the microscope. Considered as an optical instrument, to be sure, it exhibits many imperfections, which ordinarily remain unnoticed only on account of its intimate connection with our mental life. But, as soon as scientific goals demand great sharpness of resolution, the eye proves to be insufficient. The microscope, on the other hand, is perfectly suited to precisely such goals, but that is just why it is useless for all others. (6)

That the *Begriffsschrift* is here likened to a microscope is suggestive; the microscope is one of the tools of mechanical objectivity that serves to regulate the scientist’s fallible eye and willful self. The *Begriffsschrift* is likewise a regulator; it seeks “to provide us with the most reliable test of the validity of a chain of inferences and to point out every presupposition that tries to sneak in unnoticed, so that its origin can be investigated” (6). The *Begriffsschrift* is a policing agent, something that can catch unlicensed intuitions and prevent them from insidiously “sneak[ing] in.” It thus fulfils the ethical dimension that Daston and Galison argue is so crucial to objectivity. Importantly, however, for Frege, objectivity was determined not by images at all, machine-aided or otherwise, but rather by communicability. The *Begriffsschrift* sought to police intuitions and psychologisms because they were *incommunicable*. Because they were not transferrable from one scientist to another, they were conceived as merely personal rather than objective (Daston and Galison 270). To maintain structural objectivity, subjectivity of all kinds—including, ultimately, images—must be purged away.



Figure 4. An example of Frege's notation. Peano would render it as " $(R \supset (Q \supset P))$."
Image from Macbeth 49.



Figure 5. The turnstile, signifying assertion.

The *Begriffsschrift* has often been received as an early version of present-day quantificational logic, and is often read through the lens of present-day usage (and the extent to which the 1879 *Begriffsschrift* lives up to it).⁵⁵ Frege's idiosyncratic two-dimensional notational system (Figure 4), which is very different from present-day logical notation, has been a particular target of ridicule, although Frege himself recognized its alienating quality and defended it, later dryly remarking that "the comfort of the typesetter is certainly not the *summum bonum*" (364).⁵⁶ As Danielle Macbeth has argued, it is worth taking Frege's logic "on its own terms," since a number of its features (the two-dimensional visual notation among them) cannot be explained in the terms of quantificational logic as we now know it (vii, 1).⁵⁷ Indeed, the alienating quality of Frege's notation, almost universally disparaged by philosophers and logicians alike, is, as Daston and Galison observe, part of its efficacy; the *Begriffsschrift* seeks to enforce *logical* connections in part by baffling psychological and heuristic connections, "break[ing] the domination of the word over the human spirit by laying bare the misconceptions that through the use of language often almost unavoidably arise concerning the relations between concepts and by freeing thought from that with which only the means of expression of ordinary language, constituted as they are, saddle it" (Frege 7). The *Begriffsschrift* is a positive construction in its own right, but its objectivity is guaranteed by its opposition to the powerful forces of psychology, "breaking" and "laying [them] bare" and "freeing thought from" them—clearing away the underbrush, as Stein might put it. Frege is thus perfectly aware that logicians may be "frightened off by an initial impression of strangeness" (7). The notation's alienating quality is part of what makes it objective, and I would suggest that the stylized, alienating language in "Melanctha" operates in a similar way. Consider a paragraph like this one:

Melanctha Herbert somehow had made him [Jeff] feel deeply just then, what very more it was that she wanted from him. Jeff Campbell now felt in him what everybody always had needed to make them really understanding, to him. Jeff felt a strong disgust inside him; not for Melanctha herself, to him, not for himself really, in him, not for what it was that everybody wanted, in them; he only had disgust because he never could know really

what it was really right to him to be always doing, in the things had had before believed in, the things he before had believed in for himself and for all the colored people, the living regular, and the never wanting to be always having new things, just to keep on, always being in excitements. All the old thinking now came up very strong inside him. He sort of turned away then, and threw Melanctha from him. (178)

The Language poet Steve McCaffery might call this language “counter-communicative” (62), even though it actually describes a scene of articulating (or attempting to articulate) knowledge. The language is repetitive, lending it a disorientingly recursive quality. While critics like Michael North have productively analyzed the repetition of key lexical words (in the passage above, for instance, “feel”/ “felt,” “disgust,” “strong,” “really”), function words are equally if not more likely to be repeated in “Melanctha.” Function words pervade everyday language, of course, which is why they normally go unnoticed even when repeated. But here the repetition of function words, and the grammatical functions that they entail, assert themselves:

Melanctha Herbert somehow had made him [Jeff] feel deeply just then, what very more it was that she wanted **from him**. Jeff Campbell now felt **in him** what everybody always had needed to make them really understanding, **to him**. Jeff felt a strong disgust **inside him**; not for Melanctha herself, **to him**, not for himself really, **in him**, not for what it was that everybody wanted, **in them**; he only had disgust because he never could know really what it was really right **to him** to be always doing, in the things had had before believed in, the things he before had believed in **for himself** and for all the colored people, the living regular, and the never wanting to be always having new things, just to keep on, always being in excitements. All the old thinking now came up very strong **inside him**. He sort of turned away then, and threw Melanctha **from him**. (178)

The repetition of the sequence **preposition + him[self]** works to communicate Jeff’s psychological state as a set of unvisualizable spatial relationships. By constantly positioning ideas, feelings, and attitudes vis-à-vis “him,” even when there can be no ambiguity about the indirect object, Stein anchors and solidifies Jeff, insisting upon his centrality and presence. Yet by exceeding grammatical necessity, these prepositional phrases become intrusive, interfering with the sense of the sentences. For instance, “Jeff Campbell now felt **in him** what everybody always had needed to make them really understanding, **to him**.” Diegetic context illuminates the sense of the sentence: Jeff has learned that Melanctha’s “understanding” (elsewhere “wisdom” and “learning”) comes from her wide sexual experience, and has extrapolated that such actions are *always* the condition of “understanding.” Jeff apprehends this rather than knows it; he feels it “in him.” The “to him” at the end of the sentence disrupts more than it clarifies; the most normative possible reading is that “to him” is redundant, and a more capacious reading would suggest that it raises semantic questions rather than putting them to rest: Does “to him” mean something different, in the context of the sentence, than “in him”? Does “to him” modify

“understanding,” so that the kind of understanding under consideration is specifically the kind approved by Jeff? The **preposition + him[self]** sequence in this passage thus impedes immediate grasp of the sentences’ meaning, yet it does so not by “breaking” syntax but by reinforcing it, amping up its use of function words and *increasing* syntactic structure. We are, in other words, overloaded with syntactic cues, provided not with too few but with too many. This is especially true in the long, highly subordinated sentences that appear throughout the story, such as the one that forms the heart of the paragraph above: “Jeff felt a strong disgust inside him; not for Melanctha herself, to him, not for himself really, in him, not for what it was that everybody wanted, in them; he only had disgust because he never could know really what it was really right to him to be always doing, in the things had had before believed in, the things he before had believed in for himself and for all the colored people, the living regular, and the never wanting to be always having new things, just to keep on, always being in excitements.” The sentence is complex enough that diagramming it would actually be of practical use; again we are prevented from forming a quick impression; again we must follow a complex logical tree in order to make sense of it. And again, the sentence is not difficult because it underspecifies but because it overspecifies; we already know, for example, Jeff’s bourgeois opinion of how “the colored people” should “liv[e] regular,” yet the sentence specifies these things at the *expense* of clarity. The syntax of “Melanctha” thus performs the clarity-through-obscurity that also underwrites Frege’s theory of objectivity.

That Stein foregrounds syntax is a common enough observation, but while an emphasis on syntax already concords with Frege’s project, what is even more striking are the particular syntactic features that are foregrounded. In addition to repetition, we see in “Melanctha” unusual uses of negation, nested syntax, quantification, and suspended judgment, all of which are features of formal logic generally and of Frege’s logic in particular. Importantly, the features that make the linguistic environment of “Melanctha” similar to Frege’s *Begriffsschrift* are also the features that make it difficult to parse and more or less unsummarizable. The use of negation, for instance, flamboyantly foregrounds the logical structures embedded in the writing: “I don’t say it, no never to you, that that would not have been the right way for me to do, Melanctha” (175). Although the text occasionally uses the colloquial double negative (“I certainly never would have told you nothing” [175]), the logical negative is by far the more pervasive structure. Here negations seem to cancel one another out, yet the presence of the negations also necessitates longer and more complex sentences that impede reading. Moreover, while the negations seem to cancel one another out logically, the sequence of negations itself leaves an emotional trace; to not say that something is *not* true is a suspension of assertion, whereas to say it is true is to assert positively. And this emotional trace, like the alienation occasioned by overdetermined syntax, matters not only for a reader but diegetically.

Indeed, the suspension of assertion, partly enabled by negation, is a key feature of the linguistic environment of “Melanctha.” As in *Q.E.D.*, there is a constant desire to assign truth-values to the relationship between Melanctha and Jeff. “Tell me true,” says Jeff repeatedly, “[t]ell me honest” (165, e.g.). But somehow, it is never possible to “[t]ell me

true.” As Jeff repeatedly complains, “I certainly don’t know anything at all about you, and I certainly don’t know which is a real Melanctha Herbert” (165). Jeff and Melanctha’s declarations of love are couched in affirmations of certainty, negations, and truth-valuations, performing exquisite specificity; however, access to true feelings and desires can never be granted, because even the “true feelings” are uncertain. Though wrapped in tissue-layers of counter-communicative precision, the kernel is always an undefined variable rather than a truth value. Here is an example: “[Jeff] did not know very well what it was that he really wanted. He was very certain that he did not know very well what it was that Melanctha wanted” (163). Here, knowledge is attenuated by “very well,” and desire is intensified by “really,” but these markers of precision circle around a blank – “what it was.” The second sentence reenacts this precise, detailed statement of uncertainty, adding another layer of modification – “he was very certain.”

Melanctha, for her part, handles questions about unknowns by keeping them as unknowns, by variable manipulation, as it were. Instead of specifying a value for x , Melanctha creates another expression involving x , referring the question back to the asker. “‘You know very well Jeff Campbell,’ said Melanctha, ‘You certainly do know very well Jeff, you don’t think really much, of my talking. . . . You know that’s true what I am saying Jeff’” (161-2). Jeff makes similar appeals to what Melanctha “already knows”: “Sure Melanctha, you know that already” (“M,” p. 95). But the “already” known is in fact never known, but instead deferred. Consequently a truth-value cannot be determined; judgment is suspended. This feature of “Melanctha” corresponds to one of Frege’s more idiosyncratic developments, what he called the “judgment stroke.”⁵⁸ The turnstile symbol (Figure 5), signifying assertion, was popularized in mathematical logic by Bertrand Russell, but Frege distinguished between the functions of the vertical and horizontal strokes, calling the horizontal stroke the “content” stroke and the vertical stroke the “judgment” stroke. Frege therefore conceived the content of a logical statement as distinct from its truth-value. While this distinction has not been retained in quantificational logic—indeed, Ludwig Wittgenstein famously declared it “logically quite meaningless”—Frege’s particular interest in the objectivity guaranteed by structure itself makes the distinction intelligible in the context of the *Begriffsschrift* (Macbeth 184n7). This distinction is key in “Melanctha,” in which entire waves of interaction between Jeff and Melanctha are sustained on the basis not of “what is true” but on the basis of the complex structures themselves. Indeed, in the world of “Melanctha,” pure structure can and must signify. As the affair between Jeff and Melanctha dwindles, we find that “Jeff Campbell knew very well too now inside him, he did not really want Melanctha, now if he could no longer trust her” (“M,” p. 134). Jeff’s certainty is predicated on a judgment of desire that is predicated on a possibility – “if he could no longer trust her” – that is ultimately decided only by the structures around it. Structures alone are communicable, and they suffice as the basis for action.

So far I have discussed “Melanctha” in the terms of its “linguistic environment,” as though it were homogeneous. Yet this is not quite true; for one thing, the sentence-level repetitions are partnered by larger-scale repetitions, most notably the recapitulation near the end of the story of the initial description of Melanctha’s relationship with Rose

Johnson. It is this that has led Fleissner to identify a repetition-compulsion in “Melanctha,” which she reads as a manifestation of the Freudian death drive. The environment of suspended judgment, what Lisa Ruddick and, to some extent, Michael North have read as a semiotically slippery “wandering” environment, is eventually shut down: one day someone does tell Melanctha something true, the dandy Jem Richards, with whom Melanctha has an affair after Jeff leaves her at last. Jem begins a section of dialogue with Melanctha in the expected fashion: “Tell me Melanctha right and true, you don’t care really nothing more about me now Melanctha” (237). Melanctha’s evasion, like Jem’s question, is expected; she turns the question about herself into a question about Jem: “Why you ask me that, Jem Richards.” But instead of wondering further or acting on partial knowledges built on unknowns, Jem expresses an unqualified feeling: “I just don’t give a damn now for you any more Melanctha.” The substitution of a value for a variable disables Melanctha’s “wandering” strategy of interaction and the story’s entire judgment-suspending *modus operandi*; “Melanctha never could have for this an answer” (238). The story quickly collapses after this episode, and Melanctha perishes within a page, a classic naturalist death. It is a fulfillment in a number of senses. In that it follows from the repetition of the novel’s initial scenes with Rose Johnson, the final movement seems structurally mandated on a macro level, just as it seems mandated on the sentence level when Jem finally assigns a truth-value to the omnipresent question of affection. And because Melanctha is constituted by these structures and by structured typologies (she seems to be a Type I, in the terms of “Cultivated Motor Automatism”), her death seems to arise out of her constitutive malady, her repetitious and “wandering” nature.

Yet this wandering also produces knowledge, the “understanding” that, as we have seen, both comforts and horrifies Jeff:

Jane Harden never would say Melanctha never had a good mind, but in those days Melanctha certainly had not been very understanding. Jane began to explain to Jeff Campbell how in every way, she Jane, had taught Melanctha. Jane then began to explain how eager Melanctha always had been for all that kind of learning. Jane Harden began to tell how they had wandered. Jane began to tell how Melanctha once had loved her, Jane Harden. Jane began to tell Jeff of all the bad ways Melanctha had used with her. Jane began to tell all she knew of the way Melanctha had gone on, after she had left her. Jane began to tell all about the different men, white ones and blacks, Melanctha never was particular about things like that, Jane Harden said in passing, not that Melanctha was a bad one, and she had a good mind, Jane Harden never would say that she hadn’t, but Melanctha always liked to use all the understanding ways that Jane had taught her, and so she wanted to know everything, always, that they knew how to teach her.

Learning and understanding are of course euphemisms for sexual experience, but I wish to insist on the way that Stein frames sexual experience—specifically a promiscuous sexuality—as knowledge as well. Indeed, there is something remarkably industrious in Melanctha’s learning, especially in the diversity of people with whom she sleeps. Melanctha, with her

abstracted body, “half made with real white blood,” and sustained by an abstracted language, is a kind of scientist, a gatherer of knowledge. That she is also in a sense a classic naturalist victim of her own constitutive malady does not contradict her figuration as a (female) scientist. It is true that Melanctha, as a typologized and pathologized, impoverished, sexually promiscuous, bisexual woman of color, is a scientific *object* in much the same way as Nana; indeed her name, a play on “Melancthon” (Greek “black earth”), links her from the beginning to the dying Nana, “déjà une moisissure de la terre,” a “mold of the earth” (438). Yet as I have argued above, the repetitious, compulsive modern woman, whether a typist or a scientist or merely—as Melanctha’s promiscuity *also* suggests—a shopper, a consumer, is undecidably both experimenter and experimentee, a machine-woman whose objectivity inevitably reads as objecthood. Indeed, it is never entirely clear whether Melanctha’s behavior is really “wandering” or “learning”—is leisure (and consumption) or industry (and knowledge-production), dissipation or creativity. Melanctha ultimately *dies* of “consumption” (tuberculosis), and that consumption is her constitutive malady, not a self-consumption as Ruddick suggests but the consumption counterposed against productive labor, quite literally:

Melanctha never killed herself, she only got a bad fever and went into the hospital where they took good care of her and cured her.

When Melanctha was well again, she took a place and began to work and to live regular. Then Melanctha got very sick again, she began to cough and sweat and be so weak she could not stand to do her work.

Melanctha went back to the hospital, and there the Doctor told her she had the consumption, and before long she would surely die. They sent her where she would be taken care of, a home for poor consumptives, and there Melanctha stayed until she died. (238-9)

Melanctha’s death, then, is not simply tuberculosis but an *oscillation* between “work” and “consumption.” The abstractionism of “Melanctha,” “the first definite step away from the nineteenth century and into the twentieth century in literature” (ABT 54), thus models the abstraction of the modern knowing/known woman herself.

IV. Seeing Clear: Portraits and Repetition

I have argued so far that Stein’s experimental modernism runs on a naturalist logic marked by an extreme, anti-visual objectivity, the early traces of which can be seen in the scientific work that she completed prior to writing her major literary works. I have also argued for understanding this objectivity as a specifically female objectivity, not the situated knowledge of Harding and Haraway but one deeply embedded in social realities all the same: a “camera work” that crucially served to regulate and guarantee scientific objectivity, and yet which also had the tendency to occlude the female scientist as such, to render her an instrument of science or even an object of science. If knowledge in “Melanctha” is, as I have outlined above, indivisible from sex, it is also indivisible from gender. For Melanctha, to actively work for “understanding”—an activity known in some contexts as “research”—is

already to position herself as sexually promiscuous and pathologically repetitive, a hysterical typist with an automatic hand, a thing needing to *be* researched. To do camera work is to be abstracted, and thereby dematerialized.⁵⁹

Melanctha's abstracted and anti-visualized "pale yellow" body is therefore the concomitant of her wandering pursuit of understanding, her attempt to "see very clear" (139). To close, I wish to apply this reading of Stein's experimentalism as anti-visual structural objectivity to the numerous "portraits" Stein wrote around the same time as *Three Lives* was published. Two of these appeared in Alfred Stieglitz's journal *Camera Work: A Photographic Quarterly* in 1912; they were portraits of Matisse and Picasso, two painters with whom Stein has become permanently associated not only biographically but artistically. So our reading of Stein through the rubrics of objectivity should not preclude the notion that Stein was invested in visuality, albeit an abstracted visuality; she clearly was.

And if I have argued that camera work is a kind of exact repetition, then we should also look to Stein's self-representation in *The Autobiography of Alice B. Toklas* as someone constitutionally *incapable* of the machinic camera work of objectivity. "Gertrude Stein tried to copy *Three Lives* on the typewriter," we learn, "but it was no use, it made her nervous" (52).⁶⁰ This inability to copy is later rooted in childhood with an anecdote in which Stein writes a description of a sunset that is "chosen to be copied out on beautiful parchment paper," but "[a]fter [Stein] had tried to copy it twice and the writing became worse and worse she was reduced to letting someone else copy it for her" (75-6). One way to read this retrospective self-presentation would be to see it as staking out a position of genius—a position staked out explicitly at the outset of *Alice B. Toklas* when Toklas's voice tells us, "[t]he three geniuses of whom I wish to speak are Gertrude Stein, Pablo Picasso, and Alfred Whitehead" (5). As Barbara Will, following Andreas Huyssen, notes, one strain of modernism anxiously opposed the work of art—created by genius—to its mechanical reproduction (5).⁶¹ The Stein of *Alice B. Toklas* is a genius, not an amanuensis. But while the persona Stein constructs for *Alice B. Toklas* cannot copy, that is not where it ends; in "Portraits and Repetition" (1935), Stein denies the possibility of copying altogether, explicitly in reference to her repetitive stylistics:

Then also there is the important question of repetition and is there any such thing. Is there repetition or is there insistence. I am inclined to believe there is no such thing as repetition. And really how can there be.... once started expressing this thing, expressing any thing there can be no repetition because the essence of that expression is insistence, and if you insist you must each time use emphasis and if you use emphasis it is not possible while anybody is alive that they should use exactly the same emphasis. (288)

Repetition is not repetition even when it is exact, because the mere fact of its having been repeated changes its emphasis, turns it into "insistence" (288). Thus Stein's highly abstract and essentially non-visual portraits operate by repetition because repetition is the essence of camera work, the mechanical female scientific labor of abject mimesis. Female camera work is the link between (visualized) mechanical objectivity and anti-visual, anti-psychological structural objectivity. Repetition now not of the visual image (the traced brain section) but

of verbal structures eliminates any trace of heuristics, forcing the reader to register the shift in emphasis that inheres in each new repetition. Each repetition, as Stein's invocation of the cinema suggests, is like an anti-visual, abstracted photograph, capturing not only likeness but, as Roland Barthes puts it, the "this-has-been," a moment in time that can be neither erased nor recovered (*Camera* 79). "I was doing what the cinema was doing," Stein writes. "I was making a continuous succession of the statement of what that person was until I had not many things but one thing" (294). Thus there are no shortcuts in reading the portraits, as in reading "Melanctha"; there is no possibility of summary or condensation, no picture worth these thousand-word portraits. They are, like the cinema with its repeated photographs flashing before our eyes, time-bound; the speed with which one watches a film is no more than the speed that inheres in the film apparatus itself.

"Melanctha Herbert never really killed herself," but her naturalist compulsion nonetheless produces an anti-psychological and anti-visual objectivity that make Stein's portraits a way of "see[ing] very clear." It is precisely the absence of psychological shortcuts in Stein's structural objectivity that makes it "as exact as mathematics," and that produces the signature chiaroscuro of modernism, clarity through obscurity, a blackness half made with real white blood. Thus Stein's abstract determinism—both typological and semiotic—is the surprising ground for an experimentalism that does not break with protocols—objectivity, repetition, camera work—but revels in them. Scientific objectivity marches on, and not against it but through it, Stein might say, "[t]he difference is spreading" (*Tender Buttons* 313).

Notes to Chapter Three

¹ *Q.E.D.* 13.

² *Camera Lucida* 14.

³ "Types," in this chapter, will refer to racial and character types, not to be confused with the specialized notion of "type" or "type specimen" that will be introduced with respect to natural history in Chapter Four.

⁴ See, for instance, Fleissner and Ruddick.

⁵ Laura Doyle offers a useful summary and critique of critical responses to Stein's treatment of race in her article "The Flat, the Round, and Gertrude Stein: Race and the Shape of Modern(ist) History." "Especially since Sonia Saldivar-Hull's important essay critiquing white feminists' blindness to Stein's racism," Doyle writes, "critics interested in discussing the radicalism of Stein's experiments have struggled to reconcile these two aspects of her fiction, sometimes feeling forced to choose between appreciation and condemnation of this text or that."

"But to praise some of Stein's work and deem some of it racist only obscures the ways race is more inherent to her fiction and to Western narrative as a whole in the ways I have been sketching. As recent work on modernism corroborates, the modernists'

racializing of language, characters, and plots is of a piece with, rather than an unfortunate diversion from, their literary innovations" (256). But Doyle also argues, I feel correctly, that the very bluntness of the racism in "Melanchtha" is self conscious and "calculated to offend," "to echo the audience's racism in a way that makes readers squirm—all the while creating the author as author through the power of racism" (263). I find Doyle's reading compelling; it points to the ways in which racial privilege is precisely what enables a certain kind of modernist critique of racism (264).

⁶ See, for example, Juliana Spahr, *Everybody's Autonomy*; Charles Bernstein, "Poetics of the Americas"; and Carla Peterson, "The Remaking of Americans: Gertrude Stein's 'Melanchtha,' and African-American Musical Traditions."

⁷ The books are *Women, Compulsion, Modernity: The Moment of American Naturalism* and *Rich and Strange: Gender, History, Modernism*, respectively.

⁸ For a particularly generative examination of the category of celebrity in the late Stein, see Goble.

⁹ This is not to say that the realist texts have been entirely neglected; most overviews of Stein's work give them some attention, and critics like Catharine Stimpson, Janice L. Doane, and Daylanne English have written substantially on them. *Q.E.D.* has been particularly examined as precursor to "Melanchtha," and the overtly lesbian love plots have made these texts sites of particular interest for gender and women's studies.

¹⁰ See, for instance, Copeland 10.

¹¹ Chodat's critique of Meyer leads him to observe that "scientific" has too often been bandied about as a term of general approbation, and too rarely applied with much specificity, a point that is well taken.

¹² James is the scientist most cited by Stein herself, for example in *The Autobiography of Alice B. Toklas*, in which she calls James "[t]he important person in Gertrude Stein's Radcliffe life" (78), but much of her lab work at Harvard was done under Hugo Münsterberg and E. B. Delabarre.

¹³ See Maria Farland's well researched account of Stein's attempt to publish during medical school in "Gertrude Stein's Brain Work," pp. 124-5.

¹⁴ The issue of "interest" is of course much more complicated than it is within the scope of this chapter to explore. In her essay "Merely Interesting," Sianne Ngai has recently argued that interest "toggles" between aesthetic and nonaesthetic judgments, making it the ideal grounds for cagey critical remarks that wish to make aesthetic judgments without avowing them as aesthetic. Desire seems implicated in this discussion.

¹⁵ On the importances of the idea of a split self in the nineteenth century, see Harrington.

¹⁶ Solomons and Stein circumspectly recuse themselves from the question of the unconscious, writing that

It must not be understood that any attempt is made to answer the vexed question of a so-called 'subliminal consciousness.' This question cannot be settled experimentally, unless it be admitted

beforehand that the automatic acts of normal subjects, between which and the 'second personality' an analogy is asserted, are themselves unaccompanied by consciousness. But this is by no means universally admitted. The question of consciousness, in all cases where it is not directly experienced, is essentially a philosophical one, and the facts of psychology have little, comparatively, to do with it. (493)

¹⁷ Unfortunately, it is beyond the scope of this chapter to explore in detail the way in which distraction was secured: through the reading of fiction, evidently popular fiction. "For distracting attention," Solomons observes, "literature that is easily followed and emotional in character is by far the best" (508). This literature played a crucial role in the experiment, and indeed in maintaining the scientific character of the experiment, since it was only through its distraction that the elements of "second personality" might be simulated at all. But the main criteria for identifying such scientifically useful literature were not the criteria of literary evaluation, but rather its demands on cognition (ideally low) and affect (ideally high). The kinds of literature described by Solomons and Stein as useful for the experiment indeed seem distinctly pot-boilerish, and one throw-away comment—"Dialect stories do not go well at all" (504)—attests to the eclecticism and openness to popular literature that may have attended the experiments. The literature of distraction used by Solomons and Stein may well be the same literature of distraction critiqued by social theorists like Walter Benjamin, who lamented "[t]he replacement of the older narration by information, of information by sensation" (159). Jonathan Crary has argued persuasively that the distraction that Benjamin diagnosed was only a part of a broader, pervasive dialectic of attention and distraction that rose to prominence at the end of the nineteenth century. See Crary, *Suspensions of Perception*, especially pp. 49-51. Tim Armstrong, in a chapter titled "Distracted Writing," takes up Crary's critique with specific reference to "Normal Motor Automatism," arguing that Solomons and Stein's experiments in attention and distraction help map out the shift from the nineteenth century notion of double personality into what Kittler calls the "discourse network circa 1900," in which writing is reconceived as "pure behavior" (Armstrong 205).

¹⁸ As Kittler wryly points out, "While German universities still trembled at the thought of the chaos women students would provoke, the Harvard Psychological Laboratory had long been desexualized. In their test report, Solomons and Stein are referred to throughout as 'he.' The scientific discourse gives only hints that during this strange cooperation the man dictated and the woman wrote" (227). The hints to which Kittler alludes appear on pp. 500 and 506 of "Normal Motor Automatism." Kittler's observation about the gendering of the paper's language—always a neutral "he"—is well taken, but his suggestion that Stein was *always* the subject, and Solomons always the experimenter, is by no means clear from the article. According to Wilma Koutstaal, Solomons and Stein "served, in turn, as investigators and subjects" (13).

¹⁹ Additionally, the web site for the Woods Hole Marine Biological Laboratory, where Gertrude Stein spent a summer, inexplicably excerpts “Normal Motor Automatism” in its page on Stein. There is no reference to “Cultivated Motor Automatism.” See “Women of Science: Gertrude Stein (1874-1946).”

²⁰ Crary’s study of modern fascination with the attention/distraction dialectic takes up many of the ramifications of this conception of attention that are beyond the scope of this chapter. See Chapter 1 of *Suspensions of Perception*.

²¹ “Les pustules avaient envahi la figure entière, un bouton touchant l’autre; et, flétries, affaissées, d’un aspect grisâtre de boue, elles semblaient déjà une moisissure de la terre, sur cette bouillie informe, où l’on ne retrouvait plus les traits” (438). See also Sander Gilman’s discussion of this moment (105).

²² See especially Gilman on the conflation of race and illicit female sexuality. For a sophisticated reading of “Melanctha” through Nella Larsen’s *Passing*, in the context of passing narratives of the period, see Corinnne Blackmer.

²³ “Quel nom, en effet, lui donner, à ce type si fécond et si misérable, si poétique et si abject, si moral et si repoussant, énigme vivante que n’ont pu éclairer ni les recherches de la science, ni les dévouements de la charité, ni les efforts de l’intelligence? Pendant bien longtemps encore cette femme, dans laquelle viennent se résumer tous les dévouements et toutes les bassesses, toutes les délicatesses de la passion et toutes les corruptions de l’âme, se dérobera à la triple investigation de la science, de la religion et de la morale; elle demeurera toujours comme un des plus grands mystères du cœur humain et des nécessités sociales” (245). The translation is my own.

²⁴ Peter Brooks reads Nana in precisely this way in his essay “Storied Bodies, or Nana at Last Unveil’d.”

²⁵ The friend was Henri Céard. See Brown 433-4.

²⁶ Cohen’s literally color-coordinated table of racial stereotypes is well worth examination (120).

²⁷ See also the numerous Harlem Renaissance narratives, for instance in Nella Larsen’s *Quicksand* or Jessie Fauset’s *Plum Bun*, that describe light-skinned African Americans as being “yellow as a banana”—an image that, outside the slang conventions of the period, presents us with a jarring image.

²⁸ On the emphasis on research in the study of medicine at Johns Hopkins, see also both articles by Harvey.

²⁹ Florence Rena Sabin (1871-1953) was “a classmate of Stein’s at Johns Hopkins. Sabin was three years older than Stein and a year ahead of her in medical school. They were acquaintances, thrown together with the other female students, yet their medical careers took different paths. Sabin was a talented embryological anatomist ‘who is credited with discovering that the lymphatic vessels arise from endothelial budding from embryonic veins—a discovery that was confirmed only as late as 1999.’” She became “the first woman appointed to the Johns Hopkins medical faculty” (Morgan, “Embryography” 311-2) and “set the standard against which [Stein’s scientific work] was judged” (Meyer 85).

³⁰ See Rossiter; Schiebinger; Kass-Simon, Farnes, and Nash; Oreskes; Galison.

³¹ On situated knowledge, see especially Haraway, "Situated Knowledges," in *Simians, Cyborgs, and Women*, and Harding, "Rethinking Standpoint Epistemology."

³² On the mechanicity of science and its surprising compatibility with a mystical gnostic reading of science, see Roland Barthes, "The Brain of Einstein."

³³ On the problematic of the technician more generally, see Latour; Latour and Woolgar; Pickering; Pickering (ed.); Shapin, "The Invisible Technician." [Add to WC List]

³⁴ On female scientific illustrators, see Daston and Galison 89; see also Gates, Shteir, Schiebinger.

³⁵ As Georges Canguilhem has suggested, it is not so much that people and other organic beings are figured as machines as that machines are modeled on living beings in the first place. On women as figures of capitalist modernity, see Brown (198); Felski; Fleissner, "Dictation Anxiety"; Fleissner, *Women*; Huyssen.

³⁶ The multiple valences of female labor, as indicating on one hand (often reproductive, e.g. typing) paid work outside the home and the literally reproductive labor of giving birth have been admirably explored with respect to Stein by Jennifer Fleissner and Daylanne English in particular (in *Women, Compulsion, Modernity and Unnatural Selections*, respectively). See also Maria Farland's discussion of Stein's "brain work."

³⁷ As Anne Raine rightly points out, it is a fallacy to suppose that "science is modern and nature is not." I invoke the assumption here as Raine does: it is a "modernist assumption" that informs discourses of the period.

³⁸ Edison describes the women in question as "moins distantes, en RÉALITÉ, de l'espèce animale que de la nôtre" (258). Edison tells Ewald that such women ought to be killed "without scruple nor any sort of trial, for the reason that one does not enter into discussions with a vampire any more than with a viper" ["...sans scruple ni autre forme de procès, par la raison qu'on ne discute pas plus avec le vampire qu'avec la vipère"] (259). Translations of Villiers are my own.

³⁹ "Tenez: l'abeille, le castor, la fourmi, font des choses merveilleuses, mais ils ne font que cela et n'ont jamais fait autre chose. L'animal est exact, la naissance lui confère avec la vie cette fatalité. Le géomètre ne saurait introduire une seule case de plus dans cette ruche, et la forme de cette ruche est, précisément, celle qui, dans le moindre espace, peut contenir le plus de cases. Etc. L'Animal ne se trompe pas, ne tâtonne pas! L'Homme, au contraire (et c'est là qui constitue sa mystérieuse *noblesse*, sa sélection divine), est sujet à développement et à l'erreur. Il s'intéresse à toutes choses et s'oublie en elles" (Villiers 255-6).

⁴⁰ Siegfried Kracauer would later take as the focal point of his famous essay on "The Mass Ornament" (1927) the Tiller Girls, "a group of militarily trained dancing girls" whose mechanical, synchronized motions constitute "a linear system that no longer has any erotic meaning," nor even military meaning, but simply "the ornament, whose closure is brought about by emptying all the substantial constructs of their contents" (356n1, 77).

⁴¹ Yet the mechanical/mechanized woman complicit with capital's relentlessness was not always a figure of horror. As Jennifer Fleissner points out in, near the end of the nineteenth century the woman-as-typewriter became an increasingly acceptable stage of a narrative that still logically concluded with maternity and the nuclear family ("Dictation Anxiety" 419).

⁴² See especially Meyer 90-1.

⁴³ My argument therefore parallels arguments variously made by Laura Doyle, Jennifer Fleissner, and Michael North, who all see insistence of various kinds—insistence on racial stereotypes for Doyle, on the logic of typology for Fleissner, on the language of insistence ("certainly" etc.) itself for North—as destabilizing of the very thing being insisted upon. My account draws crucially on these scholars' readings, and especially Fleissner's; I similarly suggest that Stein's extreme objectivity constitutes, in part, a questioning of objectivity. Yet I wish to observe that such questioning only comes about through the production of a *poetics* of structural objectivity, which is to say that Stein also makes structural objectivity into a positive and generative presence rather than a mere object of critique. Thus, as Fleissner argues, "the idea of a risky productiveness or creativity" is "conceived *through* repetition, rather than opposed to it" (256). I wish to amplify this insight by extending it to other features of structural objectivity.

⁴⁴ For other accounts of this episode, see Bridgman; Farland; Meyer; Schoenberg; Wineapple.

⁴⁵ Morgan recounts the many conflicting stories she encountered regarding the actual brain that Stein was to model: "Neither Stein's model nor the accompanying manuscript have survived, and descriptions of the specimen in the correspondence were maddeningly contradictory. Each of Stein's professors and classmates, all trained embryologists and presumably capable of using technical terminology correctly, referred to the specimen differently. One called it an 'embryo,' another a 'seven-month fetus,' another a 'new-born babe,' and one a 'six-month-old child.'" As Morgan goes on to explain, the conflicting accounts brought into relief the degree to which Americans have come to believe in a predictable normative developmental progression that would make it possible to encounter any given brain and determine the age of the specimen from empirical evidence alone ("Embryography" 306).

⁴⁶ Stein also recounts in *Alice B. Toklas* how, as a result of her failure in medical school, a "very close friend Marion Walker pleaded with her ... Gertrude Gertrude remember the cause of women." But the two disagree, "Not, as Gertrude Stein explained to Marion Walker, that she at all minds the cause of women or any other cause but it does not happen to be her business" (ABT 82-3). Here again exaggeratedly enacting objectivity, Stein dissociates herself from "the cause of women," separating the knower from the known.

⁴⁷ Although Barker cites Stein's studies twice in his *Nervous System and Its Constituent Neurones*, he does not include any of her drawings.

⁴⁸ Stein also seems to implicitly compare her work to Sabin's, saying that "[her] object has been to save the next man from a longp Xperlimentarywork," Sabin's *Atlas* was similarly meant to "save the student much time for real study, now often spent in getting started" (Knower, "Editor's Preface" 5).

⁴⁹ Several critics, including Meyer and Morgan, have taken at face value the assertion in *The Autobiography of Alice B. Toklas* that Stein was bad at drawing, and indeed, incapable of correlating an object with a visual image thereof (Meyer 93; Morgan, "Embryography" 317; ABT 76). That drawing was not Stein's greatest talent is corroborated by the accounts of peers ("Embryography" 317), but to take the statements that "She cannot draw anything. She feels no relation between the object and the piece of paper. When at the medical school, she was supposed to draw anatomical things she never found out in sketching how a thing was made concave or convex" as bald statements of fact ignores ABT's status as a literary work. As I discuss below, the *Autobiography* represents Stein as incapable of producing paper copies of anything whatsoever, whether from nature, from her own mind, or from a manuscript; "[a]s a matter of fact her handwriting has always been illegible and I [Alice] am often able to read it when she is not" (76), and "Gertrude Stein tried to copy *Three Lives* on the typewriter but it was no use" (52). The absoluteness with which the Gertrude Stein of ABT is incapable of mimesis (in what might be called the historical Gertrude Stein's most mimetic work to date) is suggestive, but not necessarily a reliable source of biographical data.

⁵⁰ One wonders at the unfortunate figure of "the eye of the old hand."

⁵¹ See Perelman in particular.

⁵² See especially Ashton, DeKoven, Farland, Fleissner, Meyer, North, Ruddick.

⁵³ Intension, as opposed to extension, defines a class of objects by its characteristic properties rather than by attempting to enumerate (as Stein claims to attempt in *The Making of Americans*) its constituent elements. See Jennifer Ashton's indepth discussion of intension in Stein in Chapter 1 of *From Modernism to Postmodernism*. On the influence of Whitehead see also Chapter 4 of Meyer.

⁵⁴ As Daston and Galison hasten to point out, structural objectivity was not a "movement" but a value (or a set of values), and to say that two different thinkers—say, Frege and Poincaré—both interested themselves in structural objectivity is not at all to suggest that they had a tendency to agree on other things.

⁵⁵ Jean van Heijenoort's influential collection *From Frege to Gödel* suggests a clear trajectory of influences, but it is not entirely uncontroversial. On the *Begriffsschrift*'s contemporary reception, see Vilkko. On Russell and Whitehead and Stein, see Ashton.

⁵⁶ As the computer scientists Rob MacInnis, James McKinna, Josh Parsons, and Roy Dyckhoff have recently described Frege's notation, "[t]he lack of abbreviation, coupled with the two-dimensional layout, renders the notation essentially unreadable for all but simple formulae" (2). They note, however, that "the second dimension allows us to observe structural relationships that are only visible in modern notation via parenthesisation" (3).

⁵⁷ The literature on Frege is too vast to summarize here, but see especially Dummett and Sluga. In their account of structural objectivity, Daston and Galison follow Sluga in attributing Frege's understanding of objectivity to that expounded in Hermann Lotze's 1843 *Logik* (Daston and Galison 266). In his essay "Objectivity and Reality in Lotze and Frege," Michael Dummett dissents, pointing to a key distinction between Lotze's and Frege's uses of the term *wirklich* (usually translated "real"). Dummett argues that, unlike for Lotze, "for Frege, physical objects are objective as well as *wirklich*" (114). The material point for the present study, however, is that for Frege, that which is objective *need* not be real. Dummett's and Sluga's positions represent an ongoing debate about Frege's realism. See Hans Sluga, "Frege as a Rationalist," in M. Schirn, Ed., *Studies on Frege*; Dummett, *Frege: Philosophy of Language*; Sluga, *Gottlob Frege*; Dummett, "Frege as a Realist," in Dummett, *Frege and Other Philosophers* (Oxford: Oxford UP-Clarendon, 1991).

⁵⁸ On the judgment stroke, see Martin, Chapter 3.

⁵⁹ In this dimension my reading parallels Bill Brown's reading of *The Monster*, in which the now-faceless black servant, abstracted into a generic "monster," acts as a site where black minstrelsy and the freak show converge, producing an absolute (abject) spectacle that, Brown argues, comes "to allegorize the process of photographic development as facial disfigurement" as well as "to develop a figure for the new theatricalizing apparatus, the camera: an eye without a face" (236). I have left the element of minstrelsy out of my discussion, since it has been very competently taken up elsewhere (see especially North and Doyle), but it seems to me that the confluence of race and gender in "Melanchtha" help define the possibility of doing the camera work of objective science.

⁶⁰ See also Steven Meyer's provocative discussion of these passages (102-3).

⁶¹ Bob Perelman, in a nuanced discussion of the problematics of genius in Stein's writing, argues that "Stein as writer needs to be differentiated from Stein as genius" (167).

Chapter Four

Marianne Moore's Precision

With Miss Moore a word is a word most when it is separated out
by science, treated with acid to remove the smudges, washed, dried
and placed right side up on a clean surface. Now one may say that
this is a word.

—William Carlos Williams, “Marianne Moore” (1925)

Neatness of finish! Neatness of finish!
Relentless accuracy is the nature of this octopus
with its capacity for fact.

—Marianne Moore, “An Octopus” (1924)¹

That Marianne Moore is a “precise” poet has long been a commonplace of Moore criticism. “We are now used to calling Marianne Moore an observer of unique precision,” Evelyn Feldman and Michael Barsanti write (7), while Bonnie Costello indicates that “[p]recision is [Moore’s] passion” (*Imaginary Possessions* 38). Robin G. Schulze, meanwhile, indicts Grace Schulman’s edition of Moore’s poems (2003) because, as she puts it, “the saddest argument that this entire edition makes is that Moore was not very precise” (“How Not to Edit” 132). Schulze’s comment, suggesting that any half-awake reader of Moore should *know better* than to suggest that Moore was not precise, reveals how central the idea of precision—or as Schulman herself puts it, “exactitude”—has come to be for Moore studies (xxvi).

Precision is perhaps the most widely agreed-upon feature of Moore’s poetics, and as a mode of securing knowledge, it has served to ratify Moore’s position as a central figure of American modernism. Modernist writers sought to create a literature that constituted real knowledge, knowledge in a strong sense, of which scientific knowledge was, at the turn of the twentieth century, the gold standard. As Thorstein Veblen put it in 1906, “modern common-sense holds that the scientist’s answer is the only ultimately true one” (4). Thus Ezra Pound could write approvingly that “[i]f [the physicist Guglielmo] Marconi says something about ultra-short waves it MEANS something. Its meaning can only be properly estimated by someone who KNOWS” (ABC 25). Marconi, the physicist-inventor, and not the poet or the literature professor, was the exemplar of the *meaningful* speaker. Scientific knowledge was held up as paradigmatic of knowledge itself, and experimental science, as a set of protocols and conventions for obtaining it, was therefore looked to as a model for what Charles Altieri has termed the “new realism” (*Art* 12). Precision is a scientific

desideratum, an “epistemic virtue,” as Lorraine Daston and Peter Galison would call it (39), and thus Moore’s “precise” poetics has generally been taken as evidence of a modernist seriousness about reality.

Yet while the scientific new realism was a widespread feature of modernism, and one particularly attributed to its more vocal male practitioners (Altieri, following Daniel Albright and Ian F. A. Bell, takes Pound and William Carlos Williams as his case studies), it is Moore who seems to be most widely and unanimously called a “precise” writer—so frequently, in fact, that the suggestion of “fussy” emerges. We are much more likely to discuss other modernist poets in terms of “sincerity,” as Ezra Pound would call it, or “objectification,” in Louis Zukofsky’s formulation, while Moore is always “precise.”² If modernist poetics involved a heroic, even scientific commitment to a realism more realist than realism, there nonetheless seems to be a critical suspicion that Moore may have even taken it a bit too far—that, like that of the glacier she describes in “An Octopus,” Moore’s relentless accuracy and capacity for fact have a threatening quality to them. Thus among Moore’s contemporaries as well as in subsequent criticism, Moore’s precision has been read doubly, to confirm her as both a serious, scientific-minded modernist and an easily dismissed fussy spinster or a “hysterical virgi[n],” as Hart Crane put it in a 1927 letter (522).

That the same attribute—precision—should both ratify Moore’s poetics as capable of knowledge and disqualify it as hysterically incapable of knowledge discloses its complexity. In this chapter I wish to put pressure on this notion that Moore is “precise,” not to overturn the label but to examine its implications for the way that Moore’s poetry is constituted as a site of knowledge. The ambivalence of precision rests on its applicability to two different but linked domains. Insofar as precision is the mark of a laudable accountability to reality, it is understood as a neutral scientific practice, independent of material or social contingencies. Yet insofar as it is read as fussiness, it is a quality inhering in the poet herself: Moore is made out to be a precise *person*, making precision a feature of her personality—a virtue. And indeed, while there seems at first to be no *necessary* connection between precision and morality, in practice Moore criticism has always made precision a kind of righteous honesty. A remark by Wallace Stevens, in a review of Moore’s 1935 *Selected Poems*, may serve as an example. “Miss Moore is scrupulous,” Stevens writes. “That Miss Moore uses her wit is a bit of probity ... Instead of being intentionally one of the most original of contemporary or modern poets, she is merely one of the most truthful” (113, 117). Stevens’s remark calls attention to the double status of being “truthful”: it is at once an intellectual aspiration and a moral virtue. Indeed, Stevens opens his review by attributing to Moore a “scrupulous spirit,” a personal quality that he hastens to reassure us is not the same as “hyperaesthesia,” a malady of poetic “fastidious[ness],” underscoring rather than deflecting the dubiousness of precision’s virtue (113). Precision here verges on pathology: even Stevens’s warm review seems to register a profound mistrust that reveals the extent to which precision’s epistemic and moral valences intertwine.

There is an obvious feminist critique to be made here, that critics are guilty of assuming that a woman, and especially an unmarried woman cannot possibly know her

own mind, and that if she is virtuous it is because she is careful, hesitant, and self-doubting—in a word, modest.³ Such attributes are much valued in women, and it comes as no surprise that, when we wish to approve of a woman poet, we should do it in just this way.⁴ That knowledge, and scientific knowledge in particular, is gendered in U.S. culture, has been more than amply documented.⁵ But I would argue that Marianne Moore's virtuous precision provides grounds for an even more basic critique, in that it reveals "gender trouble," to borrow Judith Butler's phrase, in the allegedly masculine values that modernism sought to import from science. I will argue in particular that the potential threat in Moore's precision lies in its ties to the values of natural history, a discipline that was enamored of, even as it worked to contain, the empirical sublime of biological diversity. And because Moore's precision bears a heavy burden in Moore criticism, not only intellectual but also moral, it is necessary, I think, to find out more about what it is.

Precision is an important descriptor of Moore's poetics, but a complex one that not only reveals but also occasions considerable ambivalence. Stevens's epithet, "scrupulous," connoting an almost pathological caution ("Scruple"), is one that has been echoed by critics from Kenneth Burke to Sandra Gilbert. I wish to suggest that Moore's poetic precision enacts the knowledge-securing properties as well as the ambivalences of the science of her period—specifically, the science of natural history. Scientific knowledge stood in for "the only ultimately true" knowledge, yet science has always been polyvocal; as Steven Shapin has succinctly put it, "[f]aith in Method grew even as incompatible versions of what such a Method might be proliferated" (32).⁶ Thus Moore's precision cannot be said to imitate a coherent scientific practice—nor does it reject natural history practices in favor of "alternative" poetic ones. Rather, as I will argue, Moore's poetic precision enters into contemporaneous debates *within* natural history about how to remain accountable to the diversity of real, physical animals and plants being studied. Moore's own "scrupulous" accountability to a physical reality, manifested in complex syntactic and referential structures, reproduces the overwhelming quality that the techniques of precision are meant to manage, revealing a poetics whose very commitment to knowledge as such lends it a darkly unknowable dimension.

I. How to Be Precise

The word "precision" has a variety of uses, but it always entails reference to some kind of fixed point, a thing being approached, approximated, separated out, described, retrieved, or (in the case of a pattern) maintained—some real toad to ground whatever imaginary garden may surround it. Thus to be precise is always to be precise *with regard to something*. Moore's precision has often been located in her form, which is in turn often reduced to her use of "syllabics," as if the mere presence of poetic meter were unusual in a poem, and as if syllabic meter were the defining feature of Moore's poetics. Yet as a gloss for "precision," formal regularity has little explanatory power; moreover, it proves insufficient to account for Moore's vast body of free verse poems, including such important poems as "An Octopus," "Marriage," and most versions of "When I Buy Pictures," which

are widely allowed to be “precise,” and which indeed are often thematically concerned with precision, but which clearly are not formally “regular.” To allow the rubric of “syllabics” to eclipse other aspects of Moore’s precision is, I would suggest, a symptom of broader ambivalences about precision: we wish to imagine the precise poet as always obsessive-compulsively counting things, even when she is manifestly not doing so, a point to which I will return. I therefore wish to respect the precision of Moore’s form while interrogating the terms on which it has been identified. How does precision secure knowledge? And what kind of knowledge?

In order to answer these questions, I wish to offer a reading that illustrates how precision plays out in Moore’s poetry. Precision, I will argue, manifests in three ways for Moore. First, there is precision in its technical, etymological sense of “[t]he action or an act of separating or cutting off, esp[ecially] the mental separation of one fact or idea from another.” Second, precision may be a “degree of refinement,” which I locate in Moore’s much-touted attention to “detail.” This aspect of precision itself requires some explanation, namely of what counts as a detail. And finally, as I will argue, precision manifests in a definition, the earliest instance of which is given in the *Oxford English Dictionary* as 1965: “[t]he accuracy of an information retrieval system, expressed as the proportion of items retrieved by a particular search that are relevant” (“Precision”). I locate the precision of accurate retrieval in Moore’s quotation practices, which are perhaps the most remarked-upon feature of her poems. I read them in terms of the way that they “retriev[e]” outside objects and ideas—that is to say, as indices. Through a reading of “To a Snail,” I wish to establish in this section that Moore’s “precision” can be located in specific poetic practices that draw on empirical methods for both “a knowledge of principles” and “a method of conclusions.”

In his essay “Marianne Moore,” William Carlos Williams characterizes Moore’s precision in a way that suggests the kind of philosophical precision of separations when he writes, “there is ... a fastidious precision of thought where unrhymes fill the purpose better than rhymes” (313). Williams’s comment perfectly reflects the wider tendency of the critical literature: Moore’s poems are characterized not just by “precision” but by “fastidious precision,” praise subtly blended with reproach, even fear. Williams is, nevertheless, a sympathetic and perceptive reader of Moore’s work, and I would concur with his judgment that Moore’s rhymes are so often “unrhymes,” as he puts it, because her precision is not formal so much as intellectual; it is Moore’s *thoughts* that are precise, and language must follow as it may. This subordination of form to an epistemic investment is characteristic of experimental writing. Precision of thought manifests in the eschewal of what Moore, in earlier versions of “Poetry,” calls “high sounding interpretation[s].” As Williams puts it, “she despise[s] connectives,” preferring “a swiftness that passes without repugnance from thing to thing” (313). There is a “lack of cement” or mortar in Moore’s poems, a refusal to connect the dots on the reader’s behalf (312). This kind of precision looks back to its etymological source, the Latin *praecisio*, the act of cutting or breaking off (“Precision”).⁷ Moore’s is a poetics of distinctions and juxtapositions, not of psychological

causality. This meaning of “precision” is well illustrated in Moore’s poem “To a Snail,” quoted below in full.

TO A SNAIL

IF “compression is the first grace of style,”
 you have it. Contractility is a virtue
 as modesty is a virtue.
 It is not the acquisition of any one thing
 that is able to adorn,
 or the incidental quality that occurs
 as a concomitant of something well said,
 that we value in style,
 but the principle that is hid:
 in the absence of feet, “a method of conclusions”;
 “a knowledge of principles,”
 in the curious phenomenon of your occipital horn. (*Becoming* 65)

In these twelve free-verse lines, the snail is hailed as a poetic model, an exemplar of “style.” Moore’s *blason* doubly subverts the genre, praising piecemeal the body of a snail rather than that of a lover, and finding therein the principles of poetic craft. Cristanne Miller’s description of “The Plumet Basilisk” could as well apply to the snail: “Like the poem itself, the basilisk that ‘you’ see ... is a work of art, a moral guide, every bit as much as it is a creature scientifically observed and precisely rendered onto a page” (45). The snail, similarly, is characterized physiologically by “compression” in a shell, “the absence of feet,” and an “occipital horn.” But these physiological attributes quickly open out into directives for the *ars poetica*, each physical feature of the snail correlating with a poetic desideratum. Thus physical compression in a shell is simultaneously the verbal compression of poetry and “the first grace of style”; the absence of feet, in this unmetered poem, indicates “‘a method of conclusions’”; and that most “curious” feature of the snail, the occipital horn, mysteriously suggests “a knowledge of principles.”

The precision of cutting or breaking off is best seen in the poem’s structure. The poem begins with two short sentences, which are clipped and aphoristic, yet syntactically complex. The first sentence takes the form of a logical inference, “if A, then B.” Such a structure gives the form of a rule aphorism, an epigrammatic statement of general applicability: under circumstance A, B always follows. The structure therefore offers a sense of self-containment (or perhaps compression); the very nature of an if-then statement is to crystallize the nature of a whole class of situations. Yet the structure of the sentence exceeds its apparent semantic content, a description of the snail’s physical compression. The statement’s logical conclusion, “you have it,” is the sentence’s independent clause, yet it is brief and semantically poor in comparison to the larger sentence’s syntactic complexity. The clause relies entirely on pronouns, “you” and “it,” for its meaning, indicating that it is

a grammatical placeholder, existing purely because grammar demands an independent clause in that particular spot. Thus the independent clause, “you have it,” relies on the much richer dependent clause, where the antecedent nouns are located, for meaning. To end such a sentence with “you have it” is to flag the excessiveness of the syntax, to acknowledge that a simpler structure might have done to convey the idea that the snail has the first grace of style: compression. This sentence in praise of compression, then, is ostentatiously and deliberately elongated, the syntax decompressed into a logical if-then formula. Yet the sentence also ends with a definiteness: “you have it,” in part because of its plainness and brevity, appears as an unequivocal statement of fact. The definite quality with which the sentence ends is reinforced by its form as an if-then statement; “you have it” is logically as well as sequentially a conclusion, a consequence of the subordinate clause. The first sentence therefore expands in order to offer a *sense* of contraction, a boundedness provided by the sentence’s gnomic if-then structure. The second sentence similarly offers a rule, in the form of a definition, “A is B,” and similarly resists the simple structure by doubling it: “Contractility is a virtue/ as modesty is a virtue.” Gnomic structures thus insist on each sentence’s conceptual self-containment, even while indulging in almost gratuitous syntactic complexity within the confines of each sentence.

While the poem begins with two short sentences, it then blooms out into a lush eight-line, syntactically complex sentence. If compression is the first grace of style in this poem, elaboration is the second, literally. Yet even this third sentence, which constitutes three fourths of the poem, is a gnomic utterance; complex though it is, it is completely contained in the hard shell of syntax. The semantic core of the sentence is that, in style, we value “the principle that is hid.” Superadded, yet deeply embedded in the sentence structure, are elaborations, in the form of two examples of things that are *not* what we value, and two examples of what we *do* value, “the principle that is hid.” As in the first sentence, lexical meaning is pushed into subordinate clauses and prepositional phrases, while, mimicking the definitional structure of the second sentence, the third sentence’s main clause, shorn of its elaborate predicate, is as stark as can be: the neuter singular pronoun and the copula, “It is.” “Precision” here thus manifests in syntactic structures capable of considerable complexity, fineness, or nuance of concept, yet also clippedness, distinction and separation (*not A but B*), a refusal of connectives, and the emphatic sense that unequivocal facts—definitions and rules—are being laid out.

The fineness and “capacity for fact” that Moore builds into the syntax of “To a Snail” bring us the second aspect of her precision, detail. In “To a Snail,” detail, like separation, is best understood as conceptual. The “details” of the poem’s complex final sentence are the four examples, two examples of what we value and two examples of what we do not value. That the two examples of “what is hid” are balanced out by an equal number of elements of an opposing category suggests a concern for symmetry, as do the doubled grammatical parallelisms in which those details are placed. Such conceptual symmetry, in fact, overrides the possibility that so much detail—especially the specifications of what we do *not* value—may be superfluous to the sentence’s main claim. That the true nature of style be explained *symmetrically* seems to be at least as important as that it be

explained *accurately*; or rather, Moore's precision entails, inseparably, a formal balance of detail as well as an abundance thereof. Perhaps it is this tendency to perform the fulfillment of formal obligations that has contributed to critics' notion that Moore is "scrupulous" to a fault. But this sense, of course, inheres in the very notion of the "detail," which is particular, subordinate, lesser, or partial, as opposed to the abstract, central, major, or whole. To say that Moore deals in details is already to suggest that she deals in the ancillary, the nonessential—that she is, in R.P. Blackmur's disparaging phrase, "content with smallness" (283). To insist on detail is *necessarily* to be "scrupulous," to have the air of fulfilling a formal obligation. Yet it must be understood that in "To a Snail," as in so many of Moore's poems, the idea that these semantically rich parallel examples are "details" in the sense of being partial or merely ancillary is only made possible by the rigor with which Moore segregates lexical meaning from the main subject and verb. When the ostensible core of a sentence is as bare as "It is," there is nothing to the sentence *but* "detail." In this syntactic reversal of figure and ground, Moore does not so much make details into the main event as disperse the main event—the nature of style—into a series of details: grammatically subordinated examples of what is manifest, what is hid. It may be objected that "To a Snail" is only one poem, and that not all of Moore's main clauses are so semantically spare; admittedly, "To a Snail" presents a fairly extreme case. Yet Moore's poems *typically* maintain a significant imbalance between the main subject and verb and the rest of the sentence, the bulk of the semantic content lying in the "details" of subordinate clauses and phrases.⁸ Indeed, such a semantic imbalance necessarily occurs when certain emphatic structures of which Moore is fond are mobilized: "There is..."; "X is Y"; "It is X that..." etc. Thus detail becomes a prominent feature of Moore's poems because she uses grammatical subordination to make so many things *into* details.

It is worth examining for a moment just what those details are, since here and in so many of Moore's poems, details bear a double burden. While I am certainly not alone in pointing to detail as an aspect of Moore's precision, critics have often located Moore's details less as structural functions than as details *of* something being described, especially animals and artifacts.⁹ Detail is often said to reflect Moore's own close observations of the animals she so often visited at museums and zoos. In "To a Snail," this sense of detail is clearly at work simultaneously with the conceptual and syntactic sense of detail that I have outlined above. The snail is indeed an object of scrutiny, and the physiological details of the snail are also the grammatically and conceptually subordinated details of the poem. Three anatomical attributes of the snail are noted: "compression" or "contractility," an "absence of feet," and an "occipital horn." Immediately with "compression," Moore invites the possibility of reading the snail itself as an exemplary poem, possessing "the first grace of style"—the snail rarely being considered a stylish, or even particularly structured, creature.¹⁰ "To a Snail" is itself short, of course, and, insofar as it packs all its details into three hypotactic sentences, compressed. Such compression, we later learn, is a feature of what "we" most value in style, "the principle that is hid" away in a shell. The other two attributes of the snail are adduced as examples of places where a principle may be hidden:

in the absence of feet, "a method of conclusions";

“a knowledge of principles,”

in the curious phenomenon of your occipital horn.

Like “compression,” the “absence of feet” suggests a poetic valence, in the use of free verse (or indeed, in the use of syllabic meter, which similarly eschews the internal rhythmic structure of metrical feet). Indeed, it is a more accurate description of the poem than of the snail, since the snail technically does have one foot, its “gastropod” or “stomach-foot,” upon which it glides.

Moore’s description of the snail therefore invites us to think that the poem was never really about a snail at all, that the snail is a pretext for writing about poetry, merely a shell to hide whatever poetic pearls might lie within. The snail’s compression and hiddenness, its *internalism*, in other words, seems paradoxically to function as pure externality, the allegorical surface for a poetic truth.¹¹ Moreover, by assimilating pronouncements about the virtues of poetic style to the physiological features of a natural object, Moore roots them in an intractable empirical reality that lends them force. To have the pronouncements about poetry “hidden” by observations about a snail is thus to render them all the more salient, to make the *ars poetica* into the transcendent truth of the snail. It is the last attribute of the snail, placed at the very end of the finely drawn out, chiasmic last lines, that punctures such a reading with its “occipital horn.” Like the punning “absence of feet,” the occipital horn is said to have a hidden dimension, but unlike the absence of feet (or indeed “compression”), it cannot be read as a formal feature of poetry. The attribute, named by a technical anatomical term, breaks the easy double meaning of the physical forms named in the poem; its technical nature mitigates against the semantic doubleness on which punning depends. Because the chiasmus in the final lines defers the revelation of the “occipital horn” until the very end, the double reading of snail as poem is reduced suddenly; only at the end of the poem are we back to a specimen, a physical fact, a snail.¹² Such an ending suggests that it is the physical fact of the snail itself that is “the principle that is hid.” Details, because they are *details* and by definition subordinated, are singularly unstable places on which to found hierarchies of meaning, which is why the details of the snail offer such duplicity—first claiming to be attributes of a snail, then posing as the more-true hidden details of the art of poetry, and finally refusing the carefully built-up poetic injunctions, in order to suggest that it is indeed the snail that is primary—that the poem, in other words, mimetically and secondarily represents the true original, the snail. The details in “To a Snail,” and specifically their inability to stably demarcate figure and ground, perhaps offer an allegory for the frustrations of empiricism, a point to which I will later return.¹³ But more importantly for our map of precision, they allow us to notice that Moore insists on details *as details*, with all the minoriness, instability, and self-subversion that that entails.

But the occipital horn introduces still one more problem in our reading of details: despite the anatomical terminology, despite the way that it so cleverly troubles the parallel between snail and poem, it is already a metaphor—for, strictly speaking, the snail does not have an occipital horn. “Occipital” refers to the occiput, or back of the head—hence the “occipital bone” at the base of the skull and the “occipital lobe” of the brain, and even an

“occipital horn syndrome” that manifests in calcium deposits on the occipital bone (Horn and Tümer 651). But snails do not have skulls, obviating the possibility of a horn; moreover, their tentacles are always in pairs and soft, unlike the “horn.” In terms of physical resemblance, a better candidate for the “occipital horn” is perhaps the pointed apex of the snail’s shell; moreover, the shell is perhaps a more “curious” phenomenon than tentacles. But this reading reduces “occipital” to a mere invocation of bone. In this final detail, concretion and abstraction again meet in vertiginous confusion. The “occipital horn” is the detail that is most apparently technical, and, owing to the narrowed semantic possibilities of the specialized anatomical terms, it is the detail that most strenuously resists assimilation into the analogy between snail and poem. Yet, to borrow Gottlob Frege’s terms, even while the possibilities of *Sinn* are narrowed, the possibilities of *Bedeutung* remain as diffuse as ever:¹⁴ the occipital horn is the least clearly referential detail named, revealing that detail in general and a technical vocabulary in particular do not guarantee clarity of reference. The occipital horn, at once thoroughly specific and thoroughly vague, stages a crisis in naming, for the term’s very specificity makes it unsuited to carry its semantic burdens. Like a single snail specimen (“a Snail”) representing the class *Gastropoda*, the occipital horn takes on an unwieldy task of signification, thus raising the problem of the relationship between the particular and the abstract. The “curious phenomenon of [the snail’s] occipital horn” alerts us to Moore’s interest in linguistic reference—not only in the instability of reference, which has become by now a commonplace that hardly warrants demonstration, but also in the subterfuges and patches by which we evade that instability. Scientific terminology is one such subterfuge; citation is another. Moore quoted heavily from a wide variety of sources, public and private, acknowledging many and not acknowledging some others.¹⁵ In “To a Snail,” for instance, Moore quotes three phrases, one from Demetrius of Phaleron¹⁶ and the other two attributed to Duns Scotus. Archival research reveals other sources and influences, notably William Cowper’s poem “A Snail” (Costello 53). The citations in Moore that interest me, however, are those that explicitly point outward from the poems, usually by naming a source in footnotes or endnotes. Such citations are indexical, referring the reader out of the text toward a source or to some physical grounds.

In using the term “indexicality,” I invoke C. S. Peirce’s use of the term, albeit strategically.¹⁷ Moore’s indexicality occurs at multiple levels, for while she performs indexicality literally with her citations, she also *invokes* indexicality in a less direct sense by proposing indexical relations between things. C. S. Peirce’s classic example of an index is a weathervane, which registers and indicates the physical presence of the wind in a manner prior to cognition or language (141). Moore invokes indexicality when, in a similar fashion, the poem becomes an index for the physical composition of the snail. Experientially, the poem is present to us, and it registers linguistically the trace of the snail’s body, as “a painted portrait...is the sign of the person for whom it is intended” not merely through resemblance (what Peirce would come to call iconicity) but “because it was painted after that person and represents him” (141-2). To be clear, the snail’s trace on the poem is not indexicality in a strict sense; there is no physical snail leaving a trail of slime (for instance)

as its index on the page. But it is clear that the poem argues for what Peirce would call a “correspondence in fact” between the physical attributes of the snail and the poetic art—that a necessary and direct relation between one and the other is being proposed if not enacted (30). And indeed, within the poem’s diegesis, where everything is already mediated by language, it is the snail rather than the poem that is present to us, bearing the trace of a poetics of which its body is the index (rather than the reverse). Thus the unstable hierarchy of poem and snail is underwritten by the indexical relation, which yields a “correspondence in fact” but not necessarily a hierarchy: a footprint implies Friday, for instance, but Friday also implies a footprint. In “To a Snail,” the two versions of indexicality are conjoined, as the snail’s physical attributes are always paired with a citation that literally bears the physical trace of some other text. The first quotation, “compression is the first grace of style,” cites Demetrius of Phaleron, imprinting the poem with a piece of text inherited from elsewhere in the world, and simultaneously imprinting the snail’s compression with a stylistic desideratum. Even more intriguing are the quotations attributed to Duns Scotus, which find in the snail’s “absence of feet” “a method of conclusions,” and in the snail’s problematic “occipital horn” “a knowledge of principles.” As Bonnie Costello observes, the citations are transformed from their original sense, taken from a source noted by Moore in a reading diary as “*Medieval Mind*, II, 516” and not from a work by Duns Scotus himself (53). The words quoted, in fact, are Henry Osborn Taylor’s, in his summary of Duns Scotus’s meditations on whether theology is a science:

Is theology, then, properly a science? Duns will not deny it; but thinks it may more properly be called a *sapientia*, since according to its nature, it is rather a knowledge of principles than a method of conclusions. It consists in knowledge of God directly revealed. Therefore its principles are not those of the human sciences: for example, it does not accept its principles from metaphysics, although that science treats of much that is contained in theology. Nor are the sciences—we can hardly say the *other* sciences—subordinated to it; since their province is natural knowledge obtained through natural means. (516)

Costello points out that Moore contracts Taylor’s apparently opposing values, “a knowledge of principles” and “a method of conclusions,” in order to map them onto the same “compressed” animal, but more importantly, I would argue, these desiderata are said to inhere in the snail’s body. The intractable material fact of nature becomes the index of a poetics—or rather, in the context of “To a Snail,” it is easy to read such criteria as constituting a poetics, though in Moore’s source they stand in for modes of knowledge, one scientific, the other not, though both, it should be noted, characteristic of the sciences of Moore’s day.

Moreover, that here, above, is the “real” source or origin of the quotation (located in digital simulacrum with the help of WorldCat and Google Books) seems beside the point. A reader hoping to track down the source on the basis of “Duns Scotus” alone would be entirely at sea; it is not a citation meant to lead one to a specific place. Moore’s indexical citations seem less concerned with the reality to which they point than with the

act of pointing itself. Moore's citations in "To a Snail" are typical in this regard; by supplementing the quotations not with bibliographic entries but with the names of authors, Moore establishes a liaison between the text and the outer world without privileging a particular origin—and without especially helping the reader locate the source of the quotation.¹⁸ That Moore sometimes silently alters what she cites reaffirms the relative unimportance of the source itself. It is even clearer when Moore cites objects rather than things. For example, in her famous 1932 poem "The Jerboa," Moore offers footnotes identifying originals for items that appear in the poem: the stone locusts, the king's cane, the fold-up bedroom, and the jerboa's matchstick-thin hind legs. The notes tell us that these things are "real" artifacts, or rather, that they correspond to real items in the world. But what is reported about the artifact often does more to establish the fact that the items are real than offer a method for seeking it out. The note on "the king's cane," for example, is curiously indirect: "Description by J. D. S. Pendlebury. *Illustrated London News*, March 19, 1932" ("Jerboa"). The note names the describer and the periodical in which it was described, which vouch for the item's reality but do nothing to direct the reader to the original physical object. These citations are therefore indexical without necessarily filling the other, more practical functions of citation. Indexicality itself is the important thing, not the absent original that subtends it. The precision of accurate retrieval, in other words, is a processual one, an insistence on the *possibility* of accurate retrieval (the king's cane is real; the snail is real, Duns Scotus is real) rather than an insistence on the priority of the thing being retrieved. Moore's indexical gestures create a sensation of the real hovering somewhere nearby, within easy reach of the poem, though the actual reaching be next to impossible.

A similar action appears in Moore's use of book indices—both the famously arbitrary index of *Observations* (with such entries as "Hueber, M.," "humility, ladies'," and "Hunt, Leigh, agreeable terror" laid neatly side by side [*Becoming* 156]) and in the indices Moore kept of her own archives. As Srikanth Reddy argues, "[t]o create an index, or alphabetical key, to such a miscellany displays an extraordinary archival commitment to imposing order on one's knowledge prior to the act of writing. In an index, unrelated topics exist in a metonymic relation to one another; the daily sexual politics of 'Men vs. Women' [an example from Moore's index] naturally takes its place beside the otherworldly terrain of the planet (or element) 'Mercury,' which is juxtaposed in turn with the earthly mystery of 'Mechanisms of language.'" (454). Indeed, the elements of the index, like the quoted elements in a poem, exist not only in metonymic relation with one another but in synecdochic relation to the categories that they signify. As Reddy's gloss implicitly argues, to write "Men vs. Women" next to "Mercury" is not simply to honor their arbitrary status as neighbors in the alphabet but also to fashion a *conceptual* proximity between "daily sexual politics" and "the otherworldly terrain" of another planet, the things for which the words "Men vs. Women" and "Mercury" stand.

Moore's precision, then, constitutes a realism rooted in empirical assumptions. Eschewing connectives to insist on separation, Moore disallows narratives that might come to overwhelm a poem's component parts. Dispersing the poem's sense into details, both

formally and conceptually subordinated, Moore refuses the hierarchy of figure and ground, instead flooding the reader with an empirical sublime of highly ordered yet unassimilable data. And with indexical gestures, Moore pushes physical reality to the fore, insisting on its nearby presence and constantly pointing to it, even in the absence of a clear referent (like the “occipital horn”). In other words, Moore’s techniques of precision work to produce an empirical sense of the world, a sense of collecting data, of honoring the anomaly, and of drawing on the proximity of the sensible for authority—or what Lorraine Daston and Fernando Vidal might call “the moral authority of nature.” For Moore’s precision, as we have seen, is “a bit of probity,” a moral stance, and her good empirical methodology is a way of being honorable, “scrupulous.” So far this is entirely consistent with our impressions of the milieu in which Moore moved. Moore’s poetics are committed to a scientifically inflected model of inquiry that is simultaneously a moral code; this should not be surprising. But how, then, can we explain the sense of unease that attends the criticism of Moore’s precise poetics, the impression that Moore’s empiricism is fussy, fastidious, excessive, threatening?

II. The Precision of Natural History

The biological sciences in general, and their more observationally oriented branches in particular, have long held a reputation as secondary among the sciences; indeed, their very scientificity has often been called into question.¹⁹ As Ernst Mayr points out, mathematics and the physical sciences are usually taken as paradigmatic of, and supreme among, the sciences. “I must have some six or seven volumes on my shelves which claim to deal with the ‘philosophy of science,’” he remarks, “but all of them actually deal only with the philosophy of the physical sciences” (32-3). Biology was not understood as a science distinct from medicine or natural theology (the predecessor to natural history) until the nineteenth century, and the degree to which it may be considered to have partaken of the early modern so-called “scientific revolution” is, as Steven Shapin puts it, “contested” (*Scientific Revolution* 187).²⁰ So to point out, as so many critics have done, that Moore studied biology at Bryn Mawr is not to establish her scientific orientation once and for all.²¹ Biology, like the emerging social sciences if to a lesser degree, was still relatively young as an institutionalized science, and its norms and methods were, as Claude Bernard explained in 1865, necessarily distinct from those of the physical sciences. To study living organisms, populations, and ecosystems required distinct “experimental” methodologies, with particular emphasis on observation and comparison. To put it rather glibly, particle physicists can find things out about atoms by smashing them, but it will not do to smash a rabbit to find out about *it*—especially not to find out about as a living organism, for instance in its behavior or its vital processes.

The great task of the natural historian was the identification and taxonomy of species, around which turned debates about the nature of organismal diversity. This was a task of *separation*, one that had been underway since Linnaeus. Moore’s definitional syntax—“X is Y”—was thus the bread and butter of natural history, and the collection of

specimens and visual representations of plants and animals, and the comparison and analysis of their features, were its central practices. This always involved contentious problems of representation: in what light ought we consider the relation between the specimen and the species? Could we produce a single, authoritative specimen by which to synechdochically define the species? Is it possible, by dint of experience and judgment, to abstract from a large sample of specimens the “essence” of the species? Is it permissible to designate one species as the norm from which its relatives deviate? Such questions of typology and representation were questions of how to be precise—in the senses of separation, detail, and reference—and the sheer breadth of biological diversity made them particularly urgent.

One possible framework for understanding this problem of representation is the essence/population opposition, which by some accounts underwrites the difference between eighteenth-century “idealized” representations of specimens and the naturalistic images (including photographs) that became more prevalent in the nineteenth and twentieth centuries.²² Essentialism supposes that a species has an “essence” or “true nature” from which its realizations in nature deviate. Thus while flora and fauna appearing in nature might exhibit almost unlimited particularity and baffle attempts at classification, there is an underlying order in which classification is not only intelligible but clear. In broad strokes, biological essentialism is usually associated with a pre-Darwinian understanding of species as relatively fixed groups, while population thinking, which “stress[es] the uniqueness of everything in the organic world,” is interested specifically in the very diversity that populations exhibit (Mayr 46).

But it is necessary to distinguish between essentialism, which is an ontological premise, and typology, which encompasses a wide set of *practices*, for to try to separate, say, what makes a duck a duck from the merely contingent features of any given particular duck is not a blindness but a necessary prerequisite to claiming to define the category “duck.” Moreover, to recognize biological diversity as simply the state of things rather than as error or deviation from the essence does not remove the *practical* problems of communication and pedagogy within the discipline—the need, in short, to represent. In other words, typological thinking, which has characterized both pre- and post-Darwinian natural history, need not imply essentialist thinking. As Mary P. Winsor argues, “taxonomists from the Renaissance onwards adhered to a wide variety of world views, but usually chose practical considerations over theoretical purity” (387). Naturalists long before Darwin often took a “polythetic” approach that would “let a list, or cluster, of properties count as a definition without insisting that any particular property be always present” (Winsor 390). Thus the precision of separation characterizes natural history even without any particular commitment to essentialism. Natural history, in encountering biological diversity, necessarily took on a kind of empirical sublime, manifested in nature’s infinite variability and capacity for “monstrosity,” which was amply illustrated in early modern curiosity cabinets and, by the eighteenth century, the thing that natural history sought to contain. Indeed, Lorraine Daston and Peter Galison argue that eighteenth- and early nineteenth-century natural history was marked by the values of what they call “truth-to-nature,” a

concern for accuracy that sought to depict the normal and separate out nature's aberrations and freaks. Truth-to-nature is not monolithic; as Daston and Galison point out, "[t]he words *typical*, *ideal*, *characteristic*, and *average* are not synonymous, even though they all fulfilled the same standardizing purpose." These various ways of seeking a norm were "alternative ways of being true to nature," sometimes but by no means always presupposing an essentialism (69). What bound together the practices of truth-to-nature was that nature must be reasoned upon; under this logic, no particular specimen could be taken as definitive—as would later become the case, under the logic of what Daston and Galison call "mechanical objectivity," beginning in the mid-nineteenth century. By eschewing the early modern fascination with "freaks" of nature in favor of the normal, natural history sought to contain the empirical sublime, the sheer overwhelming infinity of variation in nature. Moreover, truth-to-nature did not die out as objectivity became a more prevalent scientific value. As Daston and Galison point out, "It is a sign of how dramatically scientific attitudes toward ... artfulness had changed by the mid-nineteenth century that while [English naturalist George] Edwards's invented poses won him the Royal Society of London's Copley Medal in 1750, John James Audubon's elegantly symmetrical and sometimes anthropomorphized compositions of birds in his *Birds of America* (1827-1838) were sharply criticized by some contemporary naturalists as falsifications of nature" (79). But as we will see, Audubon's legacy was large, especially in America, and moreover, even when natural history had become well institutionalized with a new emphasis on the primacy of individual specimens, the necessity of representing species had not disappeared. Increasingly, natural history turned to the concept(s) of the "type" to help contain the empirical sublime.

The "type" in natural history is the representative of a species or higher taxon. For our purposes the most important uses of the term are what Paul Lawrence Farber calls the "classification type-concept" and the "collection type-concept." Briefly, the classification type-concept lets a species (or higher taxon) serve as the model by reference to which the rest of the genus (or next-highest taxon) may be described. Thus in the later eighteenth century in his *Histoire naturelle, générale, et particulière*, the French naturalist Georges-Louis Leclerc de Buffon let the common flycatcher serve as a point of reference for describing the twenty-four other species of flycatcher (Farber 94). In this case the "type" was the "model species," the common flycatcher. The collection type-concept, in contrast, used type *specimens* to fix nomenclature (96). The "author" of a species—that is, the first to name it—would place a unique type specimen (or "holotype") in a natural history collection.²³ New specimens thought to be of the same species could then be compared with the original holotype. As Daston points out, the holotype need not be typical or particularly representative of the "essence" of the species; indeed, in species exhibiting sexual dimorphism, seasonal molting, or other variations, it would be an impossibility. Instead, "it is the name of the species, rather than the species itself, that is directly attached to the type specimen. Boundaries of species (and higher taxa) change with new discoveries and new classification schemes; names may not." It is not that the naturalist believes that the holotype is, or even could be, exemplary or typical of the species; rather, "[t]he type

specimen is only accidentally, not essentially, a representative sample of the species” (“Type Specimens” 162). The fixity of the species *name* outweighs other considerations, so that the selection of the holotype is almost pointedly arbitrary. In an age of objectivity, the hopes for accurately representing the species with an ideal or exemplary specimen are slim; instead of being exemplary, the type specimen has the virtue of being *real*. The use of the holotype constructs an unusually stable relationship between word and thing, because the name is fixed to a single specimen. In doing so, however, the holotype puts special pressure on the relationship between thing and concept—the concept, that is, of the species that the name is supposed to designate. Like Marianne Moore’s quotations, which fix *the act of pointing* and not *the thing pointed to*, the holotype, and indeed any specimen used to represent a species, offers a real physical referent at the expense of the possibility of accurately exemplifying the entire species for which it serves as a metonym. We can see an instance of these tensions in action in an 1894 note by Robert Ridgway, who wrote to *The Auk*, the journal of the American Ornithologists’ Union, to object that the North American genus *Picicorvus* was not in fact different from the Old World genus *Nucifraga*:

In ‘History of North American Birds,’ Vol. II, p. 255, it is stated that the so-called genus *Picicorvus* “is so similar to *Nucifraga* as to be hardly separable; the principal difference being in the slender and more decurved and attenuated bill, with a slightly concave, instead of convex, culmen, and plain instead of spotted plumage.” At the time, only one of the Old World species of *Nucifraga*, *N. caryocatactes*, the type of the genus, was available for comparison, and such was still the case when the A. O. U. Check-List was prepared; but more recently other species have been secured by the National Museum, and these, notably *N. multiguttata* Gould, from the Himalayas, show that the supposed distinction as to shape of the bill exists only as a specific character, *N. multipunctata* having the bill quite as slender as that of “*Picicorvus*” [sic] *columbianus*. Furthermore, the American species frequently shows indications of white apical spots to feathers of the breast, and still better developed white spots at tips of primaries. I can therefore see no good reason for continuing the recognition of *Picicorvus* [sic] as a genus, and would follow Audubon in calling Clarke’s Nutcracker *Nucifraga columbiana*.

Here we have an instance of a type species (representing the genus) and of a specimen (but not a *holotype* or *type specimen*) representing the type species. Ridgway’s note—one of many such notes in *The Auk* and other zoological journals—indicates how the type and the specimen were supposed to work as well as their limitations. It was neither practical nor possible for ornithologists to observe and compare birds in the wild when “the wild” was located on two or three different continents; thus North American ornithologists used a single specimen, brought over to the U.S., for comparison. The specimen was logically taken from *N. caryocatactes*, the type species of the genus *Nucifraga*, because the type species was the point of comparison for the whole genus. But the single specimen by definition could not reveal the variations *within* the genus *Nucifraga*, and therefore could not provide

adequate information about whether the differences exhibited by the North American specimens should be taken as distinguishing them from the genus *Nucifraga*. This could only be determined by comparing the North American birds to further *Nucifraga* specimens. We may note further in this example how little classification relies on written descriptions; rather, the written description (here that of the *History of North American Birds*) follows inspection of the specimen. Ridgway's note exemplifies the way in which the type system insisted on an ethic of "no ideas but in things," placing faith in the physical body of the organism. As the British philosopher of science William Whewell put it in his 1847 *Philosophy of the Inductive Sciences*, "Its [natural history's] lesson is, that we must in all cases of doubt or obscurity refer, not to words or definitions, but to things" (qtd. in Daston, "Type Specimens" 171). Beginning in the nineteenth century, and greatly aided by recent advances in preservation techniques, naturalists placed their faith primarily in the synechdochal reality of specimens. This is not to say that other elements might not be used; indeed, sometimes a holotype was not a specimen at all, but rather a drawing or a description by the "author" of the species. For example, the fleshy-stemmed plants of the *Liliaceae* family are difficult to preserve, and have "iconotypes" that serve as type specimens—that is, images (Daston, "Type Specimens" 160).²⁴ But such anomalies do not flout natural history's preference for specimens; rather, they confirm it in the breach, for if it were possible to preserve lilies with any reasonable hope of retaining their characteristics, the botanists in question certainly would have done so. Thus the precision of separation in natural history depended on the use of types, which worked by amassing details rooted in the physical reality of the specimen. We can see, then, how Marianne Moore's precision undertakes the problematics as well as the thematics of natural history. Rooting "a knowledge of principles" and "a method of conclusions" in the animal's body, Moore reproduces natural history's attempts to fix frameworks of signification in physical specimens.

III. The Power of the Visible is the Invisible

Natural history as a field thus depended crucially on making decisions about representation, especially visual representation. Even as the discipline professionalized, its visual norms already had a historical affinity with conventions of public display in the museum, the panorama, and the world's fair, a fact that conspired with other historical circumstances to put natural history's very scientificity in question. Just as Marianne Moore ultimately became for experimental poetry, natural history was both the friendly face of contemporary science and perilously close to a public spectacle—the kind of *didactic* public spectacle that amused in order to instruct. As Robin G. Schulze has pointedly observed, Moore

...studied John J. Audubon's birds, Jean Henri Fabre's insects, Ronald Lydekker's mammals, and Alphonse De Candolle's plants. She read works by the popular nature writers John Burroughs, Raymond L. Ditmars, W. H. Hudson, and Ernest Thompson Seton, and copied passages from the books

of conservationist John Muir. She clipped pictures from *National Geographic Magazine* and *Natural History* and scrupulously studied articles written by naturalists J. Arthur Thomson and W. P. Pycraft that appeared in the science pages of the *Illustrated London News*. She read pieces about the instruction and social application of evolutionary biology by Henry Fairfield Osborn, J. B. S. Haldane, Edward Murray East, Leonard Darwin, and Havelock Ellis. She frequently graced the halls of the American Museum of Natural History and the grounds of the Bronx, Prospect Park, and Central Park zoos. She admired and pored over the scientific descriptions and evolutionary theories of the world's most famous "monkey puzzler," Charles Darwin. ("Marianne Moore's 'Imperious Ox, Imperial Dish'" 5).

Schulze amasses this overwhelming evidence of Moore's interest in natural history as if the nineteenth-century naturalist-illustrator John James Audubon, the nineteenth-century professional botanist (and early codifier of botanical nomenclature) Alphonse de Candolle, the conservationist John Muir, and the Central Park Zoo all belonged in the same category. And while the science historian might demur, Schulze is right to do so, not only because all belong to the category of things in which Moore was interested but also because the field of natural history was and remains a capacious and unstably delimited one. Natural history had both popular and professional faces that overlapped considerably even as tensions emerged between them. This was not simply a matter of reception by a lay public, but a source of debate among professional natural historians. Moreover, these tensions and overlappings produced waves of uneven developments, as, for example, the future of natural history museum display came to be seen as lying in the past of professional natural history illustration, as I will discuss below. Natural history, as a scientific project of description, classification, and typing, enacted the very kinds of precision—of separation, detail, and indexicality—that we have observed in Moore's early poetics; at the same time, it was the site of a host of contested cultural norms that made it an unstable source of authority and a source of representational quandaries.

We can begin to see, then, how natural history's precision involved making complex decisions about representation, variously conceived. Daston suggests, for instance, that the relationship between the type specimen and the species is less *Darstellung* than *Vertretung*:²⁵ "[t]he work done by the type specimen seems ... to resemble that done in political theory by elected representatives. It is an all-too-familiar fact that political representatives do not always represent their constituencies Whether the entity to be represented is conceived as having an essence—be it the general will or the species ideal type—or as just a motley multitude, attempts to put a single face to a large group soon strain the imagination" ("Type Specimen" 179). But this is, of course, only part of the story, since the type specimen exists in a representational world also populated by descriptions in scientific journals; museum collections, both displayed and not displayed; and scientific atlases, books of images like Audubon's *Birds of America*, which serve as a "manageable, communal representative of the sector of nature under investigation" (Daston and Galison 19). Moreover, these representations merged with a much wider system of representations

in popular culture, as natural history remained a popular amateur hobby even as it professionalized within science. At the turn of the century, popular natural history drew on a long-standing tradition of natural history illustration that emphasized the whole organism, habitats and wilderness settings, often domestic or otherwise anthropomorphic poses, and clear, distinct outlines (Figure 6). As Ann Shelby Blum observes, however, by



Figure 6. “Bobolinks. Male and female in breeding season.” Popular animal portraiture represented animals in lifelike poses in their habitats. From William Earl Dodge Scott, *Bird Studies* (n.p.).

the turn of the century professional naturalists were aggressively cultivating an “impersonal ethos,” bolstered visually by zoological illustrations in which “anatomical parts rather than the whole animal were becoming the subject of illustration,” in contrast to the animal

portraiture and habitat illustrations that dominated popular works (318, Figures 7 and 8).

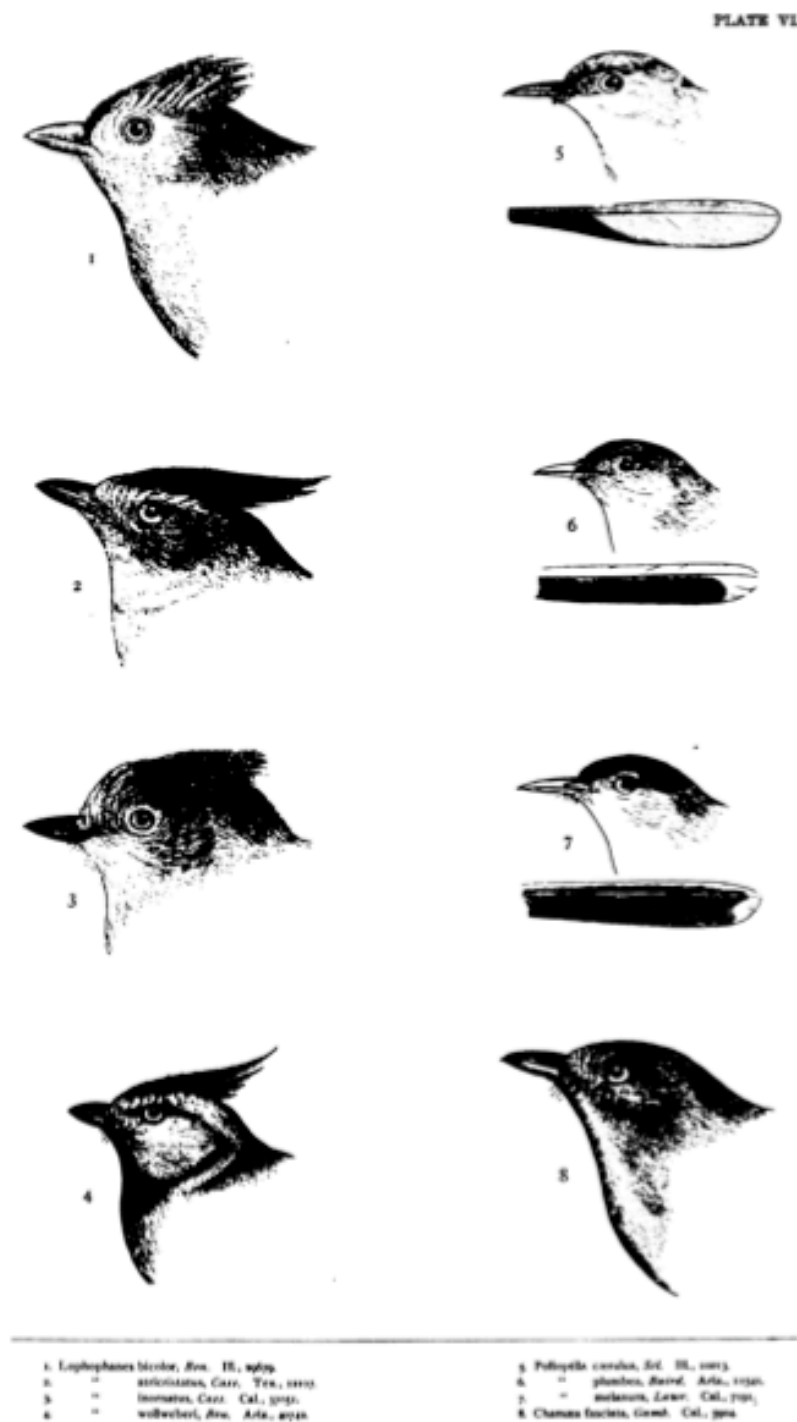


Figure 7. An example of professional, comparativist illustration. The image compares the heads of several different birds. Robert Ridgway, Plate VI, from Baird, Brewer, and Ridgway, *A History of North American Birds*.

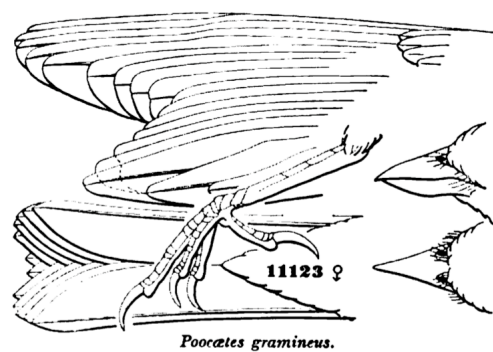


Figure 8. Another instance of professional illustration. The image of the bird has been disaggregated into its component parts. Robert Ridgway, "*Poocætes gramineus* [Grass Sparrow; Bay-Winged Bunting]," from Baird, Brewer, and Ridgway, *A History of North American Birds* (545).

Yet as Blum also points out, significant overlap occurred between these gendered worlds, especially in ornithology, which was "under constant pressure from its popular hinterland to accommodate the old natural history values" of such earlier nineteenth-century naturalist-illustrators as Audubon and Alexander Wilson (319). Amateur bird-watching was a particularly popular (and feminized) activity around the turn of the century, and at times it impinged on the activities of the professional ornithologists, as Blum recounts:

William Brewster, curator of birds at the Museum of Comparative Zoology, reacted with annoyance when he discovered that Harriet Mann Miller [writing under the pseudonym Olive Thorne Miller] had preempted his priority in the description of a new species. Why, he asked, had she not published it "in some accredited scientific journal," instead of in a popular book with a title like *Little Brothers of the Air*.²⁶ Miller responded that she, who had no training in scientific ornithology, had only wanted to share with others her delight in birds. (323)

What Brewster knew, as Miller apparently did not, was that the "principle of priority" conferred prestige in the field (and was, and still is, decisive in matters of zoological nomenclature, though nomenclature was not at stake in this particular case).²⁷ Priority could not be surrendered to natural history's female auxiliary, the Audubon societies, or to other popular arenas like pedagogy, world's fairs, or amateur field guides. In an 1899 review of two popular books on birds, for example, Joel Asaph Allen, editor of *The Auk*, castigates one author, "a schoolmaster and an amateur," for organizing his field guide around locales rather than according to morphology.

[T]here are no 'keys' for the determination of the species, no generalities whatever, nor any classification beyond the division of the subject under some half dozen headings of such an indeterminate character as to be of very slight aid as a guide to where any given bird may be found described. These headings,—'About the House,' 'Along the Highway,' 'In the Woods,' 'Across the Fields,' 'In the Marsh and Swamps,' 'By Stream and Field,'—

while prettily suggestive, can prove of very little assistance to the beginner in finding his bird. (Allen 276)

The book, with its “prettily suggestive” headings, is finally damned with aesthetic praise: “The book is beautifully printed, and with its wealth of illustrations, presents a very attractive appearance” (277). The other book, authored by “an enthusiastic ornithologist with wide experience of birds in life,” meanwhile, is “compact and businesslike,” and although the illustrations are “generally effective and helpful but rarely artistic and often quite otherwise, some of them being the worst we have seen in a modern bird book,” the book is nonetheless “trustworthy” (275, 278). The gendered distinctions between the domains of the popular and professional were clear.

But perhaps more telling of the tensions between popular and professional natural history is an article by Frank Chapman, Allen’s assistant, and, later, curator of birds at the American Museum of Natural History, reporting on “Ornithology at the World’s Fair.” Chapman’s ambivalent piece celebrates the Columbian Exposition at Chicago for its large number of zoological specimens, while simultaneously lamenting the lack of professional classification and contrasting the “finely mounted collections shown by the National Museum and the State of Kansas” with “the moth-eaten, undressed skins tacked on the wall of some exhibitor’s collection” (315). Chapman concludes a catalogue of ornithological sightings at the fair by comparing it to the disordered, uncategorized state of nature itself: “It is quite probable that in this brief review more than one collection of birds has been overlooked. Two hundred and nine acres covered with exhibits proved as difficult ‘collecting ground’ as the mazes of a tropical forest, and afforded birds quite as excellent opportunities for concealment” (321). Popular culture may hold ornithological treasures, but it utterly fails at the central task of the professional natural historian—classification—and instead reproduces nature’s potentially unlimited and even freakish particularity, the empirical sublime that natural history continued to work at containing. And indeed, Chapman’s wary interest in the world’s fair prefigures his later role as an important mediator between popular and professional ornithology, as he carefully endorsed selected artists and women writers (Blum 336). Chapman, a professional ornithologist, was also the first editor of *Bird-Lore*, the official organ of the amateur Audubon societies, which aimed to “fill a place in the journalistic world similar to that held by the works of John Burroughs, Bradford Torrey, Olive Thorne Miller, and others in the domain of books” (“Notes and News” 94). Thus did the likes of Harriet Mann Miller gain semi-official endorsement, as amateur ornithology won the qualified approval of the professional American Ornithologists’ Union, in exchange for the large and well organized Audubon societies’ help in advocating for conservation legislation (Blum 335). Still, the announcement for *Bird-Lore* that appeared in the A. O. U.’s organ, *The Auk*, also reproduced the profession’s ambivalence toward the amateurs as perhaps interested above all in the merely pretty: “Its publication by the Macmillan Company [a mainstream press] is a guarantee that ‘Bird-Lore’ as regards its typographical appearance and the character of the illustrations, will leave little to be desired” (“Notes and News” 95). The magazine’s treatment of birds would be extant; its typesetting, excellent.

The natural history museum was an important testing ground for these tensions in the early twentieth century, as its function shifted from being primarily a repository of specimens (including type specimens) to becoming, increasingly, a vehicle for public education. The American Museum of Natural History in New York was at the forefront of this shift, undertaking a commitment under the tenure of director Hermon Carey Bumpus to move toward modes of display that de-emphasized taxonomy and comparative anatomy, replacing them with the more “accessible” “habitat groups” or “museum groups.” Museum groups are free-standing displays of stuffed animal specimens, usually dioramas in which specimens are placed in a more or less naturalistic position, with an artificial background that simulates the animal’s habitat—the kinds of locales that Joel Asaph Allen might have dismissed as merely “prettily suggestive,” and neither scientific nor “useful.” Although the habitat group originated in the early nineteenth century, it did not become an important feature of natural history museums until the twentieth century (Lucas 3). The argument against habitat groups was that they were frivolous and unscientific; the eminent ornithologist and taxonomist Elliott Coues, for example, wrote in 1874, “Spread eagle styles of mounting, artificial rocks and flowers, etc., are entirely out of place in a collection of any scientific pretensions, or designed for popular instruction” (qtd. in Lucas 5). The habitat group’s emphasis on location and integral wholes harked back to the nineteenth-century norms of animal portraiture favored by the twentieth-century amateurs, as contrasted with the emphasis on taxonomy and comparative anatomy that distinguished professional natural history. In the museum, the norms of the amateurs won out and were ultimately embraced as the way of the future. Indeed, as Robert W. Rydell has argued, museums in the early twentieth century took cues—and indeed, specimens—from world fairs, borrowing the world fair’s impulse to “possess the world through knowledge of its component parts” (141).²⁸ Indeed, in his 1914 article “The Story of Museum Groups,”²⁹ Frederic A. Lucas of the American Museum of Natural History unabashedly locates the origin of the museum group in the popular spectacle of the “cyclorama,” also known as the panorama, writing that “the curved, panoramic background and overhead lighting” are “borrowed consciously or unconsciously from our cycloramas” (Lucas 29). Rightly did Frank Chapman call the habitat group a “window on nature” (qtd. in Bumpus, Jr. 63); the habitat group was necessarily framed, yet, like the panorama, it also concealed its framedness. A self-effacing medium, the habitat group offered not just specimens in the form of the animals, but entire specimen habitats. Thus the group had to offer a sense of completeness, sometimes at the expense of realism, as Lucas describes:

The Bullfrog, Giant Salamander, and Florida groups, particularly the latter, belong in still another category and may be termed synthetic, or life study groups, bringing together in one composite picture a number of animals that probably would not be found in so small an area at any one moment of the season depicted, but might all be found there at some moment of the season. [...] In this, the day of moving pictures, we may say that as the moving picture condenses into five minutes’ time the events of days or

weeks, so these groups depict in a few square feet of space the life and happenings of a much larger area. (32)

In her work on the celebrated taxidermist Carl Akeley, Donna Haraway has pointed out the ways in which the habitat group's self-contained, understandable quality sometimes derived from ideological narratives, writing of groups in the African Hall, "Most groups are made up of only a few animals, usually including a large and vigilant male, a female or two, and one baby. Perhaps there are some other animals—a male adolescent maybe, never an aged or deformed beast" (*Primate* 30). The genre of the habitat group represented nature in condensed, comprehensible tableaux.

Thus the visual norms of truth-to-nature came to triumph in the exhibition halls of the natural history museum, not because they were considered scientific at the turn of the century but rather otherwise. The natural history museum tended (and still does tend) to couch its shift to the museum group in the terms of scientific progress, especially when discussing the "advances" in taxidermic technique; thus the AMNH's early shift to museum groups was seen as progressive because the logic of the museum group came to dominate natural history museums.³⁰ But it must not be supposed that this signified a yielding on the part of the professional natural historians to popular values; rather, the profession had found a way to control the way that its work found its way to the public while maintaining what Andreas Huyssen calls "the great divide"—the bifurcation between high and low (scientific) culture. Thus Hermon Carey Bumpus, the AMNH's pioneering advocate for museum groups, explicitly rationalized the museum's shift in the terms of segregating the *professional* specimen collections from the *display* specimens by adding to the museum new sets of rooms devoted wholly to research. Research and public instruction would now be spatially and conceptually segregated within the museum. "[W]e are beginning to perceive," Bumpus wrote, "that the exhibition hall is not the proper place for the display of the collections as such, that the cases are not primarily for the installation of specimens but rather for the inculcation of ideas" (299). This bifurcation was, moreover, predicated on a particular idea of the public and of popular *vision*:

For purposes of popular exhibition and profitable instruction we no longer seek the exhaustive collections of "every known species"; we look askance at extraordinary and monstrous types; we view with some misgivings the elaborately technical schemes of classification; we wonder how much the visitor really profits by the examination, for example, of the tactile setae of the dactylopodite, and we become thoughtful when we witness the visitor's vacuity of expression as he passes before cases devoted to the phylogeny of the arachnids or some other relatively abstruse biological phenomenon, of interest to the specialist but beyond the range of vision of the ordinary museum visitor. (299)

The technicalities of professional natural history not only produce a vacuous expression on the face of the imagined visitor but are actually conceived as being "beyond the [visitor's] range of vision," like ultraviolet or infrared. To bring the visual norms of *Little Brothers of the Air* into the natural history museum thus did not compromise natural history's visual

régime, but rather gave the public the only natural history it could possibly absorb, while simultaneously confirming the superior scientificity of professional vision, with its “elaborately technical schemes of classification.” Indeed, the degree to which natural history classification was elaborate and technical seemed to be the degree to which it might overwhelm our slack-jawed visitor, reproducing the empirical sublime not with nature’s variety but with the variety of the *classification* of nature’s variety. Contrasted with natural history’s increasingly professionalized visual norms, the museum group’s panoramic, true-to-nature self-containment seemed tailor-made to deliver the empirical sublime in assimilable visual units.³¹ “In this, the day of moving pictures,” as Lucas put it, the group could contract the expanse of time and the radical diversity of the natural world, so that a single artificial habitat, neatly bound and containing single exemplars of a variety of species, could come to stand for, say, “the savannah.” Thus the natural history museum, both the holder of the profession’s treasured type specimens and, increasingly, an educator to a public imagined as liable to be overwhelmed by the empirical sublime, was a site where the specimen took on multiple functions: as exemplar, as spectacle, as fixer of nomenclature, and as the physical guarantee of a real species population, alive or extinct, somewhere out in the world.

Nowhere is Moore’s concern with these contested terms more evident than in her 1941 poem “He ‘Digesteth Harde Yron,’” a poem that may be read as a plea for conservation but which clearly engages with the multifarious issue of the specimen. The poem offers a series of “views,” both technical and panoramic, of the ostrich, a large flightless bird native to Africa. Indeed, the ostrich is first named in the poem by an English translation of the scientific name *Struthio camelus* (Greek “sparrow camel”), and our first two views of it specifically stage comparative and integral conceptions of the bird.

Although the aepyornis
or roc that lived in Madagascar and
the moa are extinct,
the camel-sparrow, linked
with them in size—the large sparrow
Xenophon saw walking by a stream—was and is a symbol of justice.

This bird watches his chicks with
a maternal concentration—and he’s
been mothering the eggs
at night six weeks—his legs
their only weapon for defense.

Moore places the ostrich at first among its extinct flightless relatives, the aepyornis and the moa, noting the former habitat of the aepyornis and specifically “link[ing]” the ostrich “with them in size.” The birds are grouped together by morphology, not by habitat. Unlike its relatives, however, the ostrich is declared “a symbol of justice,” as if being a symbol of justice were the opposite of being extinct. Singled out from the context of professional comparative anatomy, the ostrich is next placed in its habitat, guarding its eggs in a

“maternal” fashion, reproducing the locale-bound and domestic emphasis of the habitat group. At its most basic level, “He ‘Digesteth Harde Yron,’” like the AMNH, advocates for conservation, yet as Catherine Paul observes, “Moore could not have missed the irony of [AMNH taxidermist Carl] Akeley’s project—that endangered species such as gorillas were killed for display in a museum” (186).³² Like those who would make the ostrich into a symbol of justice, the museum appropriates the bodies of animals “for the inculcation of ideas,” as Bumpus puts it, and in the logic of the habitat group, to imbue the specimen with ideological power is to do the work of conservation and save it from extinction.



Figure 9. The AMNH’s Ostrich and Warthog Group, 1940. Image source: Research Library, American Museum of Natural History.

<<http://images.library.amnh.org/photos/ptm/catalog/desc/166502/1>>.

Yet the poem stages ambivalence not only about the museum’s conservationist project but about the idea of the specimen itself. The ostrich in the poem is a singular “he” that oscillates between acting as an individual animal and serving as a metonym for the whole species. The “he” that guards the nest “with/ a maternal concentration” is both a specific, individuated ostrich with a history of its own (“he’s/ been mothering the eggs/ at night six weeks”) and the stuffed museum specimen, the feathered public face of “the ostrich,” the species (Figure 9). In the poem’s final stanzas, Moore “openly condemn[s] the gluttonous plunder of ostriches,” as Alison Rieke puts it, and Rieke’s terminology is apt: it is not “the ostrich” or “the sparrow-camel,” the representative of the species that appears here, but

“ostriches” enumerated, “Six hundred ostrich-brains served/ at one banquet” and “eight pairs of ostriches in harness,” specific instantiations of the species, understood *as* instantiations (170). The potential threat of the empirical sublime (six hundred ostriches, no doubt each a bit different) is contained by the animals’ classification as ostriches and their concomitant rendering as objects to be consumed (at a banquet), yet these instances still “dramatize a meaning/ always missed by the externalist.” The poem therefore closes with a final view of the ostrich, still escaping extinction: “This one remaining rebel/ is the sparrow-camel.” The ostrich, with its “courage” and “[h]eroism,” is represented as a singular individual (“[t]his one”) that, like a “rebel,” defies the encroachments of predatory humans. Yet it is named, once again, as it is named at the poem’s outset, not as an individual bird but by its strange Greek taxonomic name, *Struthio camelus*, the “sparrow-camel.” The bird’s classification contains biological diversity, yet each bird, as a specimen, also serves as the representative and the physical guarantee of the living population hovering somewhere outside the frame, an outer reality like the real works of Duns Scotus or the real king’s cane.

IV. Precision and the Empirical Sublime

Moore’s precision is not just a marker of a scientific commitment to the real, but an engagement with a particular science’s particular wrestlings with the real, enacted through separating and defining species, detailing their characteristics, and guaranteeing them by specimen indices. Yet as we have seen, Moore’s precision also registers the tensions between the true-to-nature values of the public museum display and the objective values of the professional comparative anatomists, with their competing mobilizations of the specimen as, variously, an anthropomorphized exemplar, as the bearer of a conservationist ideology, and as the fixer of verbal signification. To understand how this precision could serve simultaneously as the legitimator of Moore’s “scientific” (and modernist) status and as the means by which she could be dismissed as “scrupulous” and fussy we must piece together a number of valences on which scientificity was operating. Natural history held a precarious place among the sciences, in part because it could not accommodate the “experimental method” as conceived in the terms set out by the physical sciences. While the “scientific experiment,” narrowly conceived, has usually been taken as the defining feature of science itself, this is largely because science was defined *a priori* by the physical sciences, while the historically posterior (and inevitably “softer,” with all the gendered overtones that the word entails) sciences like physiology, psychology, sociology, and anthropology were conceived of as “scientific” only insofar as they were capable of emulating the methods of the physical sciences. But as we have also seen, the same battles were being fought *within* natural history, as the profession drew its boundaries while simultaneously undertaking stewardship of a pop-cultural version of itself deriving from its own older and, in some cases, discredited values of truth-to-nature. I wish to argue, here, that the modernist context into which Moore entered strongly favored contemporary “objective” scientific values, which it sought to transmute into an authorial position in the

form of “impersonality.” It was, moreover, deeply anxious about a feminine popular domain from which it actively tried to distance itself even as it constantly engaged with and drew upon that domain. In Huyssen’s words,

[m]odernism constituted itself through a conscious strategy of exclusion, an anxiety of contamination by its other: an increasingly consuming and engulfing mass culture....However, modernism's insistence on the autonomy of the art work, its obsessive hostility to mass culture, its radical separation from the culture of everyday life, and its programmatic distance from political, economic, and social concerns was always challenged as soon as it arose. (vii)

While many of Moore’s associates were concerned with a distinction between the objective and subjective, the (masculine, vigorous) professional and the (feminine, sentimental) popular, Moore was concerned with precision, an epistemic virtue that negotiated elements of both domains, inciting anxiety even as it clearly hewed to an ethical sense of the real.

As we saw with the example of “To a Snail,” precision disallows stable hierarchies, submitting instead to the proliferation of detail. Since Moore’s precision takes on natural history’s tactics of containing the empirical sublime, it is also capable of registering, and indeed reproducing, that sublime itself. We recall how Frank Chapman felt that the Chicago World’s Fair reproduced nature’s untamed wilderness and, not long afterwards at the AMNH, found himself in the business of making “windows on nature” that sought to illusionistically reproduce, even as they contained, biological diversity. Nature’s threatening diversity was still a concern for, hence visible within and reproduced by, mass culture’s diversity in what we might call the “nature-culture industry”—not only natural history museums but also national parks and nature reserves, like the one described in Moore’s 1924 poem “An Octopus.” The poem, with its thick collage of quotations, often from National Park Service brochures, reproduces the park’s containment, as the glacier itself, “contained” in a nature reserve, serves as a kind of museum specimen. Indeed, as Patricia C. Willis has observed, the lists of flora and fauna in “An Octopus” appear in ascending order (249-51); this arrangement models the visual sweep of the kind of cyclorama group described by Frederic A. Lucas in “The Story of Museum Groups,” in which a large number of species and mountain elevations are compressed into a single display (Figure 10).



Figure 10. A “cyclorama group” pictured in Lucas’s “The Story of Museum Groups,” compressing a wide variety of species of different elevations into a single display.

And yet, as Jennifer K. Ladino notes, we receive “a sense that the mountain, despite our attempts to narrate it, has maintained its agency” (305); the mountain as specimen remains recalcitrant to attempts to make it signify, either as an exemplar (as in the museum group specimen) or as a type (fixing a name). The octopus of ice is only “deceptively reserved and flat”; although, as a nature reserve, it is supposedly regulated and safe for tourism, it is not, unlike the specimens in the museum, stuffed.³³ The empirical sublime, reproduced in Moore’s overwhelming syntax, filled with quoted park service “specimens,” can still crush us, not only because nature is sublimely powerful and can crush us (in an avalanche, say), but also because nature, in its infinite particularity, in its tendency to be untrue to itself and to defy the logic of the specimen, has a terrifying “capacity for fact.” The logic of the specimen registers that a “relentless accuracy” produces the Borgesian one-to-one map of the empire, so big as to cover the empire itself, and that any sense of the real guaranteed by indexicality may quickly belie any “neatness of finish.”

Marianne Moore’s poems know in the way that natural history knows: through a precision that not only takes physical objects seriously but operates by appeals to indexicality and by proliferating detail. Moore’s precision also evokes the sublime in ways that produce radical uncertainties, and while uncertainty in poetry tends to be celebrated (in the guise of “ambiguity,” for instance), there is something about the sublime uncertainty occasioned by *precision* that creates unease, because it is an uncertainty arrived

at not by happenstance or by whim but by rigorous attachment to concrete specifics. Moore's precision does underwrite the way in which she is read as a "scientifically" serious modernist, as William Carlos Williams suggests when he writes that "[w]ith Miss Moore a word is a word most when it is separated out by science, treated with acid to remove the smudges, washed, dried and placed right side up on a clean surface" (318). But I wish to return once more to the gendered implications of Moore's "scrupulousness," at which I hinted at the beginning of this chapter. For as Huyssen has famously noted, "it is indeed striking to observe how the political, psychological and aesthetic discourse around the turn of the century consistently and obsessively genders mass culture and the masses as feminine, while high culture, whether traditional or modern, clearly remains the privileged realm of male activities" (47). Moore's scrupulous precision commands epistemic authority and, at the same time, renders knowledge feminine, compulsive, out of control.

Indeed, the success of Moore's precision is entirely consonant with its threat, a fact exemplified by Ezra Pound's vision for recasting the history of literature in the terms of a history of science.³⁴ In "How to Read," Pound suggests reforming literary history on the model of (one version of) the history of science; after all, he remarks caustically, "[w]hen studying physics we are not asked to investigate the biographies of all the disciples of Newton who showed interest in science, but who failed to make any discovery. Neither are their unrewarded gropings, hopes, passions, laundry bills, or erotic experiences thrust upon the hurried student or considered germane to the subject" (15). Pound's appeal to science is directed squarely at its canonical center, physics, metonymized by that canonical hero of physics, Isaac Newton (and never mind Newton's own unrewarded gropings in alchemy).³⁵ In this moment Pound clearly agrees with Huyssen's sketched portrait of autonomous modernism, insofar as he seems to think that the "experimental nature [of modernism] makes it analogous to science, and [that] like science it produces and carries knowledge" (Huyssen 53). Repudiating the digressive, artifactual quality of literary history, Pound hopes for more systematic knowledge of literature: "Later it struck me ... that the best history of literature, more particularly of poetry, would be a twelve-volume anthology in which each poem was chosen not merely because it was a nice poem or a poem Aunt Hepsy liked, but because it contained an invention, a definite contribution to the art of verbal expression" (17). Good, scientific literary judgment turns in part on the rejection of the literary judgment of an Aunt Hepsy, presumably an old maid whose taste runs to the popular and—in an excellently precise *double entendre*—the "nice." Here Pound imagines literature attaining the status of science by casting off the *modus operandi* of a "nice" fussy spinster, one who is obsessed with irrelevant details and whose literary judgment is the very definition of bad taste. Though Pound greatly admired her, there could hardly be a modernist writer more self-consciously fashioned as an Aunt Hepsy than Marianne Moore—famously celibate, "nice" in both senses, continuously interested in popular culture, and given to the proliferation of detail.³⁶ Pound's satirical list of "unrewarded gropings, hopes, passions, laundry bills, or erotic experiences" represents the disordered irrelevancies of literary history that must be cleared away, and yet Moore admonishes that it is not "valid to discriminate against 'business documents and// school-books'; all these

phenomena are important" (*Becoming* 72).³⁷ If, as Huyssen suggests, a fear of the popular is "always also a fear of woman, a fear of nature out of control" (52), then it is not surprising that Moore, as a woman poet whose precision helped to reproduce, even as it helped to contain, the empirical sublime of nature out of control, should be regarded with a certain suspicion.

Yet what is perhaps more unnerving about Moore's poetics is the way in which it points to the location of these elements in science itself. Moore's precision never bothers to flirt with a fantasy of univocal masculine knowledge, but rather structurally tests out specific (fraught, contested) practices in a natural history that already incorporated both the all-male profession and the feminized amateurs, the diorama and the type-specimen collection, the sublime of taxonomy and the sublime of the crowd. Moore's precision, like the precision of natural history, is an out-of-control form of control, making it legible through the rubrics of what Jennifer Fleissner has called "obsessional modernity." Perhaps, indeed, this is why Williams imagines Moore as scientific precisely in the quintessentially compulsive act of washing, or why Moore's style is so often telegraphed by "syllabics," as if to mark her with an equally compulsive addiction to counting. What finally occasions unease is not a poetics that cannot know, that of the caricatured Aunt Hepsy, but a poetics that *does* know, that has a strong grasp on the real, and that calls upon "nature out of control" *in order* to know.

By invoking an empirical sublime, Moore thus also registers the ambivalent gendering of the sublime itself, most famously (and bluntly) framed in Edmund Burke's formulation.³⁸ While the sublime is typically gendered masculine, the *experience* of the sublime momentarily puts one in a "feminine" position of near-surrender followed by exhilaration. The empirical sublime similarly engages in a play of presence and absence that maps to masculine-feminine dynamics of awe and surrender, but with a key difference. For the empirical sublime is the sublime not of a solid mass but of feminine multiplicity, an infinitely porous, proliferating world of details and deformations, the sublime of biological diversity, of "nature out of control," to repeat Huyssen's words. Thus the play of presence and absence in the empirical sublime appears not only in the dynamics of awe and surrender but also in the impossible task of empiricism, to account for every detail "precisely" and yet to remain unified and coherent, itself a gendered tension between presence and absence, between (say) a snail and a poetics. While in Kantian terms an "empirical sublime" should be a contradiction, because the merely phenomenal ought not to register as sublime, the *accounting* of natural diversity, such as is the task of natural history's mechanisms of precision, by definition converts biological phenomena into a conceptual apprehension thereof, producing what Kant might approve as "a sublimity that can be found in the mind" (Kant 129). Natural history's contested structural apparatuses, in this period, thus underwrite the "agreement with nature" that, according to Kant, make it possible to construe an art work as sublime (129), and therefore, in Moore's poetry, come to constitute a ground for the sublime in their own right. The sublime resides in the highly mediated apparatuses of scientific and poetic knowledge, and indeed itself *serves as* a mode of knowledge. Precision thus marks out a precarious dialectic between the profound and

the petty, foundations and (as Moore famously puts it in “Poetry”) “fiddle,” a dialectic that is always also gendered, subtending the dynamics of aesthetic and cognitive experience that played out in the constitution of modernist scientific and poetic knowledge. As Moore put it, “there are things that are important beyond all this fiddle,” and that is—isn’t it?—always the trouble.

Notes to Chapter Four

¹ The version cited here is the version from the first (1924) edition of *Observations*, rpt. in *Becoming Marianne Moore*, ed. Robin G. Schulze.

² I do not wish to give the impression that these other values of the new realism are never applied to Moore; see, for instance, Bonnie Costello’s insightful chapter on Moore’s “Sincerity and Gusto” in *Marianne Moore: Imaginary Possessions*.

³ To my mind, the best critiques of gendered critical dismissals of Moore’s poetics have been leveled by John M. Slatin; see his “Something Inescapably Typical” and “Advancing Backwards in a Circle” as well as *The Savage’s Romance*.

⁴ Of course, Moore herself energetically mobilized the tropes of modesty throughout her career, on which see Gregory, *Quotation in Modern American Poetry*, and and Gilbert, “Marianne Moore as Female Female Impersonator,” among others. This is an important point to which I will return. For a more detailed discussion of gender in the critical reception of Marianne Moore, especially the late Moore, see John Slatin, “Something Inescapably Typical: Questions about Gender in the Late Work of Williams and Moore” as well as Jeanne Heuving’s full-length study *Omissions Are Not Accidents: Gender in the Art of Marianne Moore*.

⁵ As Michèle Le Doeuff puts it,

We are the little sisters who get the broken toys, the worn-out ideas, and the signs that are being discarded. However, the gift is snatched back when what appeared to be an ordinary stone is revealed as a diamond in the rough or something that could pass for one. The practice of attributing these negative values to women is constant in form, even if the precise content varies ad libitum. Women can be taxed with anything at all, in a way that is both arbitrary and not accidental, provided that at some point in history it has had a negative value. This phenomenon did not escape the attention of Gabrielle Suchon, who notes in 1693: “When desires are seen as marks of need and poverty, they will be attributed by the score to women and girls, since people are always ready to turn unpleasant things over to them.” She has discerned a kind of law, to which we may add a corollary underscoring the historic fluctuation of these gifts. In the seventeenth century, desire was in disrepute, and so women were said to have it in excess; today, it

has been revalued by psychoanalysis, which even sees it as a sign of mental health. Since then, it has become a male characteristic, even in the writings of female psychoanalysts. (17)

See Le Doeuff, *The Sex of Knowing*, trans. Kathryn Hamer and Lorraine Code (1998; New York: Routledge, 2003). The field of feminist epistemology explicitly treats the gendering of knowledge. See, for instance, Alcoff and Potter; Code; Harding; Le Doeuff.

⁶ Shapin applies this dictum to the seventeenth century in particular, although it certainly applies equally if not more to early twentieth-century science.

⁷ To explain the fear that Moore's precision seems to inspire, the reader is invited to insert her or his own castration joke here.

⁸ For example, no one would argue that "obliqueness was a variation of the perpendicular" (from "In the Days of Prismatic Color") is a particularly minimalist statement, but compare it with the complete sentence:

Not in the days of Adam and Eve but when Adam
was alone; when there was no smoke and color was
fine, not with the fineness of
early civilization art but by virtue
of its originality; with nothing to modify it but the

mist that went up, **obliqueness was a variation of the perpendicular**, plain to see and
to account for: it is no
longer that; nor did the blue red yellow band
of incandescence that was color keep its stripe: it also is one of

those things into which much that is peculiar can be
read; complexity is not a crime but carry
it to the point of murki-
ness and nothing is plain. (*Becoming* 91; emphasis added).

⁹ For an excellent overview of recent criticism regarding Moore's animal poems in particular, see Schulze, "Marianne Moore's 'Imperial Ox, Imperial Dish' and the Poetry of the Natural World," pp. 3-5, and notes thereto. See also Bonnie Costello's valuable chapter on "The Capacity for Fact," in *Marianne Moore: Imaginary Possessions* (Chapter 3).

¹⁰ The snail's very taxonomic class nomenclature, "gastropoda," signifies confusion: its stomach (gastro-) is its foot (pod).

¹¹ Bonnie Costello, for example, offers this reading (52).

¹² An earlier draft, titled "Snail," does not insist upon or even much support the parallel between snail and poem; though Moore mentions compression, absence of feet, and the occipital horn in the draft, all three appear in the draft's first three lines, obviating the possibility of sustaining any puns until the end. Moreover, in the draft, the puns would not function in the first place. As Costello notes, the draft is longer (less "compressed")

than the later version (52); moreover, the draft poem is arranged in syllabic stanzas that less distinctly manifest an “absence of feet” than the later free verse version of the poem. A facsimile of the draft, housed at the Rosenbach Museum and Library’s Marianne Moore archive, is reprinted in Costello, “‘To a Snail’: A Lesson in Compression.”

¹³ Srikanth Reddy notes a similar reversal of figure and ground in “The Pangolin” (472).

¹⁴ *Sinn* and *Bedeutung* are conventionally, though controversially, translated as “sense” and “reference,” respectively.

¹⁵ The literature on Moore’s use of quotation is extensive. See, for instance, Costello, *Imaginary Possessions*; Gregory, *Quotation*; Joyce; Leavell; and C. Miller.

¹⁶ In *Observations*, the quotation is attributed to “Democritus,” with no further information. In *Complete Poems* (1967), however, Moore attributes the quotation to Demetrius Phalereus (Demetrius of Phaleron), with the line from which it is drawn: “‘The very first grace of style is that which comes from compression.’ *Demetrius on Style*, translated by W. Hamilton Fyfe (Heinemann, 1932)” (Costello 52). While the citation for the first quotation becomes much more detailed in *Complete Poems*, no citations whatever are offered for the two quotations initially attributed to Duns Scotus.

¹⁷ I use “indexical” in a sense borrowed from the history of art and film theory. The term comes originally from the semeiotics of C. S. Peirce, who theorized the index that which possesses a “correspondence in fact” with the object to which it relates, as opposed to mere correspondence in resemblance, as in likeness (30). Indexicality is the state of what Peirce calls “secondness,” one degree removed from the thing itself and prior to cognition or language. The term has been useful to theorists of visual art and film because it affords a way of talking about physical presence. It has also, however, often been assimilated to a Saussurian semiotics with which it is fundamentally incommensurate, as if Peirce’s sign were simply the Saussurian sign with an extra term superadded. That art and film theorists, often theorists who are deeply engaged with structural linguistics, have borrowed Peirce’s term registers the need for a theory relating signs to physical presence; on the other hand, the use of the term “index” in art and film theory does not really engage Peirce’s semeiotics on its own terms (which are, fundamentally, the terms of a theory of mind rather than a theory of language). See Rosalind Krauss, “Notes on the Index,” Parts 1 and 2, in *The Originality of the Avant-Garde and Other Modernist Myths*. On the incommensurability of Peirce’s and Saussure’s theories of signs, see, for instance, Short and Deledalle.

¹⁸ Moore studies have benefited enormously from the insights afforded by the Marianne Moore archive at the Rosenbach Museum and Library in Philadelphia. The availability of such a complete archive has also, however, opened up the possibility of an archival fallacy, in which the sources of Moore’s references, her private allusions, and the record of her personal experiences may be asserted as the truth of her poems. Without underestimating the value of archival research, especially in exploring the poetics of one who was herself clearly fascinated by archives, I would suggest that Moore’s quotation practices—the way in which she points outward to genetic sources—already problematizes

the archival fallacy. As Bonnie Costello notes, “[t]he Moore archive also makes clear the extent to which this poet wrote from a world already represented” by museums, exhibits, books, magazines, and other media (6). Rich though the archive is, it is not and should not be taken as a source of pure origins, for, in Moore, pure origins are not the point.

¹⁹ Prestige has only recently shifted in favor of the biological sciences, especially newer fields like biophysics and neuroscience, on which see Shapin, *The Scientific Life*.

²⁰ Steven Shapin polemically introduces his book on *The Scientific Revolution* by writing, “There was no such thing as the Scientific Revolution, and this is a book about it” (1). “The scientific revolution” is a problematic label, and not only for the reason pointed out by Mayr, namely that it really applies only to the physical sciences. As Shapin observes, science historians in recent years have questioned the existence of a coherent seventeenth-century cultural phenomenon that can be labeled “science” with any specificity. Moreover, some have argued that seventeenth-century science’s continuities with its medieval predecessors are as important any breaks between them, and others have pointed to multiple possible “revolutions” in the eighteenth and nineteenth centuries (3-4). Although I use “scientific revolution” only as a conventional term of historiography, then, I do so recognizing that there are limits to its applicability.

²¹ See, for instance, Kirstin Hotelling Zona’s discussion of Moore’s “strategic selfhood,” which more or less assimilates Moore’s study of biology to the interest in quantum theory that Cristanne Miller has pointed out, and elides the values of empiricism with those of objectivity (20-1). While these disparate elements of science are clearly related, the nature of that relationship is worth probing in greater detail than has been done to date.

²² See, for example, Daston and Galison’s account of “truth-to-nature” in *Objectivity* (55-113). Although Daston and Galison are careful to note the variety of concepts according to which images of nature were standardized (ideal, average, typical, characteristic), they conclude that the “the atlas maker’s task was to determine the essential” (66).

²³ Daston discusses the concept of the “author” of a species in some detail writing, “[t]he phrase ‘author of the species sounds faintly blasphemous. Saint Thomas Aquinas (following Augustine) after all described God as the ‘author of nature,’ the drawer of species boundaries. Although the theological pretensions of modern botanists are doubtless modest or nonexistent, the legislative force of botanical naming, accompanied by a description of the new entity and a designation of its type, does recall divine fiat in some of its aspects” (“Type Specimen” 162).

²⁴ See Redouté.

²⁵ Both words indicate “representation” in German; *Darstellung* refers to the representation of a thing or idea (visually, discursively, etc.); *Vertretung* refers to political representation, e.g. in a deliberative body.

²⁶ It perhaps gives a better sense of the scope of bird-watching’s popularity to note that before publishing in the amusingly-titled *Little Brothers of the Air*, Miller had published

her findings in *The Atlantic Monthly*—a popular journal of wide circulation rather than a niche publication aimed solely at bird-loving ladies (Brewster).

²⁷ On current standards of zoological nomenclature, see the *International Code of Zoological Nomenclature*.

²⁸ Rydell is here glossing the work of the anthropologist Raymond Corbey (see Corbey).

²⁹ The American Museum of Natural History reprinted slightly revised versions of Lucas's article as a pamphlet several times.

³⁰ For studies of the "immersive gaze" and continuities between the panorama, natural history and science museums, and IMAX in the nineteenth and twentieth centuries, see Alison Griffiths, *Shivers Down Your Spine* and "'Journeys for Those Who Can Not Travel': Promenade Cinema and the Museum Life Group."

³¹ Similar arguments have been advanced about the panorama's function as a "realistic" yet domesticating depicter of the sublime spectacle of war. See especially Brown. The natural history museum's bifurcation of research and teaching is currently evident in the AMNH's web site. See Fig. 1 and Fig. 2.

³² Paul argues convincingly that Moore was familiar with the Ostrich and Warthog Group installed at the AMNH in 1940, which depicts a pair of stuffed ostriches, one male and one female, with a nest (180-3). On the subject of Moore's ambivalent attitude toward the appropriation of animal bodies, especially in the context of consumer culture, see also Alison Rieke's perceptive essay on "'Plunder' or 'Accessibility to Experience.'"

³³ I am grateful to my student Danielle Moulak for pointing out the double sense of "reserved," both as "modest" or "restrained" and as in "nature reserve."

³⁴ Moore studies flowered under the auspices of feminist criticism, to the extent that one might say that Moore criticism is *conventionally* concerned with gender. Some of the most notable explorations of gender in and around Moore's writing are also cornerstones of Moore criticism: Costello, *Marianne Moore: Imaginary Possessions*; Heuving, *Omissions Are Not Accidents*; and C. Miller, *Marianne Moore: Questions of Authority*, to name a few.

³⁵ On modernist reconsiderations of alchemy, see Morrisson.

³⁶ On Moore's interest in popular culture, see in particular Rieke.

³⁷ There is, of course, significant irony in this tension, since Pound not only enthusiastically endorsed Moore's early work but was himself given to raiding archives of ephemera for poetic ends. For a sensitive treatment of Moore's "digressions," see Reddy.

³⁸ As numerous scholars have pointed out, the notion of the sublime relies on a now discredited theory of gender. See, for example, Barbara Claire Freeman's *Feminine Sublime*.

Chapter Five

Near and Far in *Paterson*

What is it then between us?
 What is the count of the scores or hundreds of years between us?
 Whatever it is, it avails not—distance avails not, and place avails not...

—Walt Whitman, “Crossing Brooklyn Ferry”

A line just distinguishes it.

—Gertrude Stein, *Tender Buttons*¹

William Carlos Williams said to Allen Ginsberg of his late poem *Paterson*, “I don’t even know if *Paterson* is poetry. I have no form, I just try to squeeze the lines up into pictures” (Ginsberg 4). The formlessness that Williams attributes to *Paterson* alludes to one of the poem’s most distinctive and, at times, perplexing qualities, its collagelike juxtaposition of free verse, expository prose, letters, fragments from newspapers, and other documents relating to the city of Paterson, New Jersey. The terms through which Williams describes this quality are suggestive: that fundamental unit of poetic form, the line, stops being poetry at all, and instead is transmuted into a fundamental element of visual composition, as “lines” are “squeeze[d]...into pictures.” In this striking phrase, it is as though visuality supplants or substitutes for poetic form.

Why, then, might visuality serve as a meaningful proxy for poetic form? *Paterson*’s collagelike form, especially its habit of appropriating outside documents, is widely thought to be in keeping with what is perhaps the most famous phrase from *Paterson*, one that has become one of modernism’s, and Williams’s, most recognizable slogans: “no ideas but in things.” The appropriation of documents, the assembly of artifacts, is the substrate out of which *Paterson*, as a poem and as an idea, takes shape. I do not dispute the point—indeed, I will go on to argue for just such a reading. I wish, however, to interrogate the values that underwrite it; under what circumstances may such a fluid transition between the visual, the verbal, and the palpable become intelligible? And once it is intelligible, how ought we to feel about it? “No ideas but in things” has become so familiar as a slogan that it is easy to read right past the ambivalence with which Williams presents it in the opening of *Paterson*: “—Say it, no ideas but in things—” (6). Set off, at first, by dashes, the line appears less as a slogan than as a subversive suggestion, the words “[s]ay it” nearly a dare. The words recur even more emphatically when the slogan is repeated: “Say it! No ideas but in things.”

While Bill Brown rightly cautions that “‘[n]o ideas but in things’ doesn’t mean no ideas” (Sense 1), the repeated injunction to “say it” registers the self-discipline, even self-coercion, involved in such an insistence. To repeat “no ideas but in things” is to renounce all those ideas that might not be tethered to things, to place materiality at the center of one’s epistemology through an act of negation. Ideas are first banished *tout court* (“no ideas”), then allowed to re-enter through an exception (“but in things”). The imperative to “say it,” first given quietly, then as an exclamation, prefigures the violent hysteria of other escalating imperatives to come in *Paterson*, as in the disturbing scene in Book III: “Take off your clothes,/ (I said)” and “(Then, my anger rising) TAKE OFF YOUR/ CLOTHES!” (105). The insistence, early in Book I, “Say it!,” similarly imparts a note of coercion, as if to recognize the difficulty of renouncing ideas outside of things, and the loss, even violence, that such a renunciation entails. One is not inclined to “say it” unless one is commanded to do so.

As this chapter will argue, these phenomena—the formless form of *Paterson*, with its metamorphosing visual and poetic lines, and the sense of loss that attends “no ideas but in things”—are both features of an epistemology of presence that is fundamentally scientific, and specifically Boasian-anthropological, in its ideals. Both the ekphrastic action of *Paterson*’s lines and Boasian anthropology depend on establishing absolute distinctions—visual/verbal; *ethnographiable*/*historifiable*;² picturable/writable; far/near—that they then must paradoxically overcome. To set up these distinctions is to delimit the domain of the knowable, to confine knowledge to a material or visible register, to accede to the dictum of “no ideas but in things.” It is only by way of such boundary-setting that knowledge may legitimately be secured. Yet the great exception to the ban, “no ideas *but in things*,” serves as a loophole: that which can be materialized, converted into pictures, or otherwise made *present* enters the domain of the knowable.

This argument will proceed by setting up structural parallels between *Paterson*’s epistemology of presence, the logics of ekphrasis and of photography, and the methods of Boasian anthropology in the early twentieth century. While it is primarily an epistemic structure, diagnosed by way of forms and practices, that I wish to uncover here, however, it should be understood that my points of comparison are not chosen merely because they are formally similar and historically pertinent, but also—indeed, primarily—because the poem points them out; as topics of interest, photography, ekphrasis, and anthropology are already embedded in *Paterson*. There is, as should become clear in the final section of this chapter, a recursivity in *Paterson*’s approach to knowledge that ultimately accounts for its state of having what Williams calls “no form,” and what I call the form of no form—a form that, I will argue, operates in *Paterson* to transfer presence, thereby imparting what I have been calling a sense of the real. I take for granted from the start that the transfer of presence is by definition something of an impossibility; that, for instance, the photograph of Williams above the city of *Paterson* that is included in the MacGowan edition brings me physically closer neither to Williams nor to New Jersey. And yet it is the very possibility of transferring presence across time and space, of circumventing absence, that animates *Paterson*’s experimentalism. As W. J. T. Mitchell has so aptly pointed out, the intellectual

recognition of impossibility does not erase the effects of presence; I am interested, in other words, not in why we should not “believe in” the transfer of presence but in why we often—and specifically, in *Paterson*—so powerfully do.³

I. Near and Far: Presence as an Epistemic Virtue

Presence, I will argue in this section, is an epistemic virtue that Boasian anthropology and *Paterson* hold in common. In serving to secure knowledge, both for Williams and in Boasian anthropology, presence becomes at the same stroke an ethical good, a means of self-regulation that binds the knower to the known. In this sense, presence appears to be objectivity’s diametric opposite, since objectivity works to separate the knower from the known; in another sense, however, the two are similar, in that both secure knowledge through an act of renunciation. The danger against which objectivity guards is the possibility that the object of knowledge might merge with the knower; the danger against which presence guards is that the object of knowledge might be so evanescent as to elude the knower entirely, existing outside the realm of perception and measurement. Of the epistemic virtues that this dissertation considers, presence is the least obviously a scientific value, and indeed belongs to the discipline that is least obviously a science, anthropology. As this section should make clear, however, the manner in which presence operates in Boasian anthropology is central to the discipline’s claims to scientificity and parallels the structure of self-regulation evident in other epistemic virtues. Insofar as Boasian anthropology is scientific, it is interested in presence, a presence defined by the bridging of temporal and spatial gaps and the materialization of culture.

The term “presence” has become loaded with philosophical meaning, and understandably so, for it has been known to encode both temporal and spatial dimensions, both aesthetic and ontological valences. Jacques Derrida has famously critiqued the “metaphysics of presence”; Jean-Luc Nancy and Hans Ulrich Gumbrecht have more recently sought to recuperate it. While I will intermittently concern myself with these models, however, the version of presence that will resonate most powerfully with *Paterson* is a specifically visual one: the one obliquely theorized by Roland Barthes through the concept of a photograph’s *punctum* in *Camera Lucida*. The presence that Barthes invokes is less concerned with ontology than with physical proximity. Barthes introduces the *punctum* in contrast to the *studium*, the topical interest of a photograph, what a photograph is “about.” The *punctum* is not a subject but rather a “wound,” “that accident which pricks me” (Barthes 27).⁴ It is therefore not a formal feature of the photograph but rather an affective feature, at once real and imposed by the viewer; “it is,” Barthes writes, “what I add to the photograph and *what is nonetheless already there*” (55). The *punctum* is useful for understanding presence in *Paterson* because it specifically addresses the way in which presence may be transferred; the *punctum* is not formal and therefore cannot be contrived. Barthes’s *punctum* cannot be identified until the transfer is realized and the wound felt.⁵ Barthes’s language of violence—puncture, wound—registers the forceful touching that the *punctum* enacts; the *punctum* is seen, but more importantly, it is felt. Thus the *punctum*

“does not necessarily attest to the photographer’s art; it says only that the photographer was there, or else, still more simply, that he could not *not* photograph the partial object [the detail that becomes the *punctum*] at the same time as the total object.... The Photographer’s ‘second sight’ does not consist in ‘seeing’ but in being there” (47). The photograph’s *punctum* guarantees the photographer’s—perhaps more importantly, the photographic apparatus’s—temporal and spatial proximity to the thing photographed, a minimal definition of presence that nonetheless may be communicated only through a certain violence. The *punctum* thus registers the photograph’s irreducible claim on reality, without being in any meaningful sense objective. At the same time, as the title of this chapter—“Near and Far”—indicates, the presence rendered by the *punctum* is always also an absence; thus, in Jean-Michel Rabaté’s words, “[i]f photography bespeaks a past presence, it also ultimately refers to death...forcing us to stare more directly at reality” (3). As this chapter will argue, the kind of visualized presence theorized by Barthes, a presence that is transferable and deferred, helps to explain the epistemic values of *Paterson*.

Barthes’s account proposes that presence can be relayed through certain media, specifically through an emoting viewer’s encounter with the photographic image. Barthes’s account, and ultimately *Paterson*’s as well, hinges in part on the fact that the photograph is a form of “no form,”⁶ one of the many sets of representational conventions that proposes the possibility of representation without convention. By claiming to replace “form” with “pictures,” *Paterson* proposes visuality as a privileged point of access to reality. *Paterson*’s avowed purpose, after all, is, as Williams writes in his autobiography, “to find an image large enough to embody the whole knowable world about me” (391). The *knowability* of the world that *Paterson* claims to represent, Williams repeatedly suggests, is of central importance in this poem, and it is in just this fluid movement between lines and pictures that *Paterson* produces a specifically spatial knowable world. The image has power precisely because it is thought to “embody” that which is knowable, less to represent than to make flesh, to *incarnate* knowledge. Or as Williams writes in *The Embodiment of Knowledge*, “[t]he great or actual poem is the one which in its body is an increase in knowledge” (74). Williams’s form, or rather the alleged formlessness, constitutes a kind of epistemic self-regulation that makes *Paterson* into a body of knowledge.

In using the phrase “body of knowledge,” I mean to indicate not only an accumulation but also the aforementioned incarnation. For of course, the object of knowledge in *Paterson* is also already a body, that of a masculine human being: Williams figures *Paterson* as a Mr. *Paterson*, a man and poet who “lies in the valley under the Passaic Falls,/ its spent waters forming the outline of his back” (*Paterson* 6). Knowing *Paterson* means knowing the man, a man who literally embodies the place. I wish to observe three things about Williams’s choice to render *Paterson*, New Jersey as “Mr. *Paterson*.” First, this constitutes an identification of a human being with a multivalent site—a city with a history, population, and physical landscape. Second, this identification is as much a gesture of renunciation as of myth-making, for it binds the city in a body and the man in a place. *Paterson* is “fettered and chained up in clay,” brought “down to earth,” and made insistently self-present, thereby renouncing the immaterial and the non-local. And finally,

the act of renunciation inherent in the identification of man with site mirrors a key gesture in Boasian anthropology, not only methodologically (in the practice of ethnographic fieldwork) but also epistemically (in the reshaping of the discipline of which the turn to fieldwork was only the most visible manifestation). Williams's experimentalism in *Paterson* lies in just such a gesture of renunciation, I argue, and that renunciation is best made legible through contemporaneous developments in the newly institutionalizing discipline of cultural anthropology. In arguing this I do not of course mean to perversely suggest that Williams is *doing ethnography* in the same way that Boas or Margaret Mead did ethnography; he is not. He does, however, attempt to answer fundamentally ethnographic questions about a local culture, and, moreover, he takes up the epistemic and methodological values (though not the forms) of Boasian ethnographic fieldwork in order to do it.

One of *Paterson's* most striking features is its site-specificity; what *Paterson* claims to know is above all the city of Paterson, New Jersey. As Clark Lunberry puts it, in Williams's vision "the place and the poem were somehow to collide and converge into collaged form, one that was then to be seen as a whole....The words would make the place, the place would make the poem" (648). Thus, prior to the more subtle resonances that I hope to bring out over the course of this chapter, *Paterson* engages the premises of Boasian anthropology in clear and fundamental ways. Like anthropology, *Paterson* attempts to produce knowledge about the human (anthropos) by restricting the field of inquiry to a locality and examining the culture of the place. As Williams asks early in Book I, "Who are these people (how complex/ the mathematic) among whom I see myself [...]" (9) By the 1920s, in the hands of Franz Boas and his students, cultural anthropology had begun to reinvent itself in the U.S. as newly rigorous and scientific, repudiating the methods of so-called "armchair anthropologists" like James Frazer and E. B. Tylor, whose analyses were based primarily on accounts by missionaries, travelers, and other amateurs. Of particular interest for *Paterson* are two hallmarks of the Boasian turn, ethnographic fieldwork and the redefinition of culture, because both work to place limits on what can and cannot be known. To choose a site as the means of knowing the human beings who populate it, as Williams does, is a typically ethnographic gesture, and more particularly a gesture of ethnographic rigor, a means of securing knowledge through a culture's physical presence in a demarcated locale—that is, through field work. The site-specificity of *Paterson* therefore not only invokes anthropology as a field of general interest but points up a methodological innovation of the turn of the century that reshaped anthropology as a rapidly institutionalizing science.⁷

Though perhaps less obviously, anthropology's redefinition of the term "culture" was equally a gesture of disciplinary boundary-setting that worked to secure knowledge. Boas and his students deprecated uses of the word "culture" that suggested teleology or value-judgment. Instead, culture became, in Edward Sapir's words, "any socially inherited element in the life of man, material and spiritual," something possessed by any social group of any longevity (Stocking 288). The new understanding of culture sought to suspend value judgments and to place a check on ethnocentric assumptions, thereby delimiting the terms on which cultural anthropology was to be conducted. On these terms, the knowledge

produced by anthropology was to be local, specific, modest, and relatively independent of the investigator's position in the world, in contrast with the universalism of a Frazer or a Tylor.⁸ The Boasian concept of culture was, and indeed remains, instrumental in antiracist attempts to push against ethnocentrism and racial essentialism; in this capacity, the concept of culture has powerfully influenced mainstream thought.⁹ Anthropology's cultural relativism is thus a site where ethical norms interpenetrate epistemic norms in unusually salient ways; as Boas, Benedict, Mead, and others repeatedly and publicly argued, the reliability of new, presence-oriented anthropological methods had direct consequences for racial policy.¹⁰ While the ethics of mainstream antiracism are distinct from the ethics of anthropological knowledge, the former, in the moment of Boasian methodology's rise to prominence, depended crucially on the latter. Anthropology's emphasis on culture may at first blush appear to constitute the replacement of a material object of knowledge (the human body) with something more fleeting and immaterial (culture), but methodologically speaking it was the reverse, since culture was in practice materialized as place. The human body was thus transformed, in Boas's work, from a transhistorical and transgeographic concept into an environmentally situated, thoroughly material (and measurable) object. For example, Boas devoted substantial time to comparing the effects of environment on what were at that time understood as standard racial types, concluding, in a missive to the U.S. Immigration Commission, that there was "a greater uniformity of type among Americans than among the European stocks from which they are descended" ("Changes in Immigrant Body Form" 213). Anthropology's reliance on presence, was, in urgent and publicly appreciable ways, a matter of ethics.

The historian of anthropology George Stocking and others¹¹ have emphasized the considerable degree to which Boasian anthropology was implicated in the cultural criticism of bohemian and little magazine circles in Greenwich Village in the early part of the twentieth century. The relativistic notion of culture espoused by anthropology was particularly amiable to critics like Randolph Bourne, who saw the teleological, Arnoldian conception of "culture" as an obstacle to the development of a genuinely American culture (Molloy 28-9).¹² Indeed, Joshua Schuster has argued that the happy concordance between the interests of Boasian anthropology and those of Williams is more than circumstantial; for Boas and his students, Schuster writes, "[a]nthropology means attention to 'contact,' exactly what Williams expounded in aesthetic terms for the journal he named *Contact* and edited from 1921 to 1923" (121).

But what I wish to examine is less the translation of intellectual pursuits into aesthetic ones than the degree to which Williams worked to establish the writing of poetry as an intellectual pursuit in its own right, one that could, like the sciences, produce knowledge—not an attenuated poetic analogue of knowledge but knowledge itself, knowledge regulated and verified. What is therefore crucial about the shifts in American anthropology in the 1920s and 30s is that they were largely conceived as shifts toward greater scientific rigor. As Stocking observes,

Although the doctoral dissertation based on fieldwork was not yet the norm, and academically trained fieldworkers were still few in number, those

who went out from the university to the field in the 1920s were confident that they were doing ethnography in a different, more efficient, more reliable, more 'scientific' way than the travellers, missionaries, and government officials whom they were pushing to the margins of the discipline. Expressed in the metaphor of the ethnographic field as a 'laboratory,' in which a distinctive method was employed to test previously assumed comparative (or merely culturally traditional) generalizations about human behavior, this disciplinary self-image was projected with considerable success outward to the surrounding social sciences, and even beyond to the general intellectual and literate public (281)

—of which Williams was of course a member. Ruth Benedict's well received 1934 book *Patterns of Culture*, written for a popular audience, framed anthropology as a "science of custom" (1), the rigor of which rested on studying distant peoples in the field. "[T]he most illuminating material for a discussion of cultural forms and processes," Benedict argued, is that of societies historically as little related as possible to our own and to one another. With the vast network of historical contact which has spread the great civilizations over tremendous areas, primitive cultures are now the one source to which we can turn. They are a laboratory in which we may study the diversity of human institutions....It is the only laboratory of social forms that we have or shall have. (17)

That the ethnographic field is a "laboratory," in Benedict's words, signifies not only that the field is the place where the anthropologist goes to do science, but also that the field, like the laboratory, offers a crucial degree of control, a control that lies in difference. For Benedict, the alterity of the so-called primitive is central to anthropology's epistemic security. The anthropologist can only hope to uncover patterns of culture when the culture in question is as unrelated as possible to the culture of the anthropologist. In other words, it is only by going somewhere conceptually, if not necessarily geographically, far away that the anthropologist may encounter a culture for which the antiracist, relativistic definition of culture is necessary. As Arjun Appadurai reflects, "[a]t least since the latter part of the nineteenth century, anthropological theory has always been based on the practice of going *somewhere*, preferably somewhere geographically, morally, and socially distant from the theoretical and cultural metropolis of the anthropologist. The science of the other has inescapably been tied to the journey elsewhere" (356-7). Fieldwork, for the Boasians, secured knowledge by enabling the anthropologist to observe a culture that was by definition other; by producing an originary moment of contact that allowed anthropologists to read from the book of nature, as it were, rather than from the books of men; and by confining the scope of anthropological inquiry to modest, local, and specific claims.

There are obvious resonances between Williams's much-noted interest in the local and Boasian anthropology's rootedness in place, as attested by the neatness with which the contemporary anthropologist James Clifford invokes Williams's poem "To Elsie" at the beginning of *The Predicament of Culture*. But more crucially, Williams's commitment to the

local, like that of Boas and his students, is not only an investment in presence but also an act of renunciation for the sake of knowledge. In his essay “The Importance of Place,” Williams relegates to the domain of “the unknown” all the deep human truths of myth, including what Williams calls the “immaterial ultimate reality guessed at by philosophers” (131). It is precisely the domain of universal myth touched on by comparativist anthropologists that Williams now banishes to the unknown.¹³ And “[y]et,” Williams argues,

there is a palpable mode by which this “beginning” is universally objectified, where it centers not as a mystery, and that is place. ... There is a certain position of the understanding anterior to all systems of thought, as well as of fact and of deed—that is common to all: it is that in which the thinker places himself on the near side of reality—abjures the unknowable and begins *within* a certain tacitly limited field of human possibility to seek wisdom. (131-2)

Place closes the gap between the known and the unknowable, objectifies what is otherwise inaccessible and brings it into the realm of the “palpable.” By confining *Paterson* to a physical site—what he explicitly names a “field”—Williams “abjures the unknowable” in the modest scientific gesture of renunciation. Such a renunciation is the foundational gesture of modern scientificity, a gesture of constraint and of commitment to the epistemological priority of the material and the sensible. Moreover, Williams argues, rather problematically, that “the only ones who have evoked [the unknown] solidly are the prerational savages” (131), proposing a located primitive as the sole point at which the unknown materializes. That the primitive evokes the unknown “solidly” pinpoints its function: solidity is the same virtue that Williams attributes to place, the quality that confers permission to attempt to know. When it comes to human knowledge, to repeat Ruth Benedict’s words, “primitive cultures are now the one source to which we can turn” (17).

Williams’s poetics therefore repeats the experimental commitments of Boasian anthropology, guarantees of epistemic security that rest on renouncing the immaterial. Such a renunciation amounts to what Bernard Duffey has called a “poetry of presence,” an insistence on contact with the “palpable” “embodiment of knowledge,” an essentially haptic epistemology. Williams’s primitivism therefore raises real epistemological questions that have been taken up more recently by Jean-Luc Nancy and Hans Ulrich Gumbrecht. The notion that “primitive” cultures do not face the challenges of a matter/spirit divide, and are therefore capable of rendering spirit materially, is proposed not only by Williams but also by Gumbrecht, in his description of “presence cultures,” of which he takes medieval Europe as his exemplar. In a presence culture, Gumbrecht argues, knowledge need not reside in meaning (as in what he calls a “meaning culture”), but may instead be a substance, generally (divinely) revealed rather than made (80-1). Gumbrecht’s schema suggests that, while the rubrics of early twentieth-century primitivism frame the issue problematically, materially-oriented modes of knowledge may be located in cultures other than those that have given rise to contemporary Anglo-American and Continental

criticism.¹⁴ In his primitivism, Williams therefore diagnoses his own epistemic safeguards as symptomatic of an paradigm in which the priority of the material and the sensible entails just such a “giv[ing] up the search,” a renunciation and a loss of the unreal that threatens poetry itself. Such a loss is painful, moreover, and acknowledged as such, as I proposed at the beginning of this chapter, in the self-castigating tone of what is perhaps *Paterson*’s most famous line: “Say it! No ideas but in things” (*Paterson* 9).

Yet rather than turning to the primitive as a way to circumvent reason or the necessity for epistemic constraints, Williams suggests that the primitive, along with place, can serve as the condition for an experimental poetry, because it is through the primitive and through place that the unknown may be materialized and rendered an object of legitimate knowledge, specifically through methods that anthropologists were at that time practicing. Consequently, Williams’s appropriation of and projections onto the primitive, *wrong* as they are, also surprisingly produce the grounds for epistemic security, an imagined act of objectification that renders the mythic “unknowable” susceptible to study.¹⁵ This allows *Paterson* to “abjur[e] the unknowable,” effecting the characteristic scientific gesture, and yet still attempt to know it through an anthropologically delimited, primitivized site. The experimentalism of *Paterson* thus engages in a dialectic of renunciation and recuperation that is at once epistemic and affective, in love with material presence and yet a little mournful of that which has been abjured.

The dialectic of renunciation and recuperation that I have just described is likewise borne out in Boasian method, as the presence of place afforded by an ethnographic mode is an attenuated presence, a presence contingent on the alienness of the field, legitimated, in Benedict’s words, precisely by the condition that the societies under study be “societies historically as little related as possible to our own and to one another” (17). If the (primitivized) place affords presence and materiality, it is also itself already by definition alien to the anthropological observer; thus its “far” quality must always be in some measure maintained. The renunciation and recuperation of the “unknown” is therefore expressed through the geographical states of being near and far, which underwrite both Boasian anthropology and Williams’s poetics and challenge the familiarity of construing *Paterson* as “local.”¹⁶

This amounts, perhaps, to a familiar observation: that geographic centers are constituted by their peripheries, often in troubling ways. As Michael North has discussed in some detail, Williams frequently figures the United States and the culture of the local as a black, often foreign woman, an element of the far that perfectly captures the near, a “primitive” who can make the local knowable as only a primitive is knowable, or in Claude Lévi-Strauss’s term, “*ethnographiable*,” subject to ethnography rather than to history.¹⁷ “In one sense,” North writes, “the black female victim is the ultimate metaphorical version of [Williams’s] concept of American literature and art: cut off, abused, misunderstood, and all the more truthful and beautiful for it. ... And yet, when the violence and distaste that always lurk within the sentimental version of the black victim finally come into the open, they reveal how little able Williams was to join this tribe” (161). In this reading, North articulates the troubling racist logic of modernist primitivism, the process by which, in

Williams's own words, the poet may "objectify the man himself as we know him and love him and hate him" (*Paterson* xiii). Knowing, loving, and hating are all, here, of a piece.

Without reducing North's point, what I wish to bring out here is the theory of presence that is built into this poetics of near and far, one in which the poetic image is closely implicated. As W. J. T. Mitchell has argued, the ekphrastic move, in using language to re-produce the visual, manages to propose the possibility of a fluid continuity between language and the visual, but only insofar as we already conceive of language and the visual as fundamentally opposed. In Mitchell's words, ekphrasis "thematiz[es] 'the visual' as other to language, 'a threat to be reduced' ... 'a potential same-to-be,'" thus invoking a "full range of possible social relations inscribed within the field of verbal and visual representation," including race (162-3). "Race is what can be *seen* (and therefore named) in skin color, facial features, hair, etc." Thus the ethnographic dimension of ekphrasis is "not merely a question of analogy...between social and semiotic stereotypes of the other, but of mutual interarticulation" (162). Ekphrasis thus encodes, abstractly, the far and near, the unknowable and the material, but also, Mitchell argues, the racial self and other. In doing so, it also models the logic of near and far embedded in Boasian method, as in Benedict's insistence on the necessity that the people under study be "primitive" and "as little related as possible to our own [society] and to one another" (17), or in the relativistic model of culture that insists (indeed, depends) on the very alterity it seeks to overcome. In each case, the transfer of presence is proposed as the surmounting of a fundamental distance, the laborious production of a sense of the real by way of a translation from primitive (and visualizable) presence into discourse. Thus the far and near also map historically onto the *ethnographiable* and the *historifiable*, those people, in Claude Lévi-Strauss's terms, who can be pictured as ethnography, and those who can be written as history.

II. A Geographic Picture: Presence in the Image

I have made much of the centrality of the visual image in *Paterson*, especially as a site where we may witness the transfer of presence. But despite its composition in "pictures," one thing that *Paterson* does not contain is nontextual visual images. The poetic image in *Paterson* completely subsumes the visual image, so that, while visual elements appear in the presentation of *Paterson*, they are always made out of words. Typographic conventions in *Paterson* do indicate a distinction between verse and prose, and elsewhere in some places suggest block quotation, but with one key exception, no attempt whatever is made to *reproduce* anything visually.¹⁸ There is no mechanical reproduction of images, even images of texts, except in the basic sense that *Paterson* is a book that has itself been printed—which amounts to a fairly explicit refusal of mechanical reproduction for a poem so frequently described in the terms of "collage." As Williams writes, perhaps a little regretfully, in the fragment that was to become Book VI of *Paterson*, "Words are the burden of poems, poems are made of wo[r]ds" (237). If *Paterson* has pictures instead of poetic form, those pictures always resolve again into the lines out of which they were once made. Pictures of place may offer something "solid" and "palpable," but they also represent what

Alison Griffiths has called “an enduring paradox in the history of visual anthropology, a tension between the apparent sufficiency of the ethnographic image—its excess of visual detail on the one hand versus its discursive insufficiency on the other, the fact that while it may appear to tell us a great deal about a particular social or cultural practice, it nevertheless remains ‘annoyingly mute’” (129). As Barthes hints, by its very materiality, the photograph is “undevelopable”; “everything is given, without provoking the desire for or even the possibility of a rhetorical expansion” (49).

The simultaneous plenitude and muteness of the visual image once again model the dialectic of renunciation and recuperation inherent in Boasian method; the image, itself a “primitive” of writing,¹⁹ offers concretion, yet also withdraws into itself. It thereby secures its own epistemic legitimacy insofar as it refuses to say certain kinds of things—as it, in Williams’s phrase, “abjures the unknowable.” Rendered ekphrastically as a poetic image, as in *Paterson*, the image thus also enacts the drama of tension between the “primitive,” mute visual and the *historifiable*, discursive verbal, a tension that it itself proposes, as Mitchell describes above. To understand this action of concretion and muteness, I wish to consider a picture from Book I of *Paterson*—not a visual image, but a picture made out of words, an exercise in ekphrasis, given in verse, unlike most of *Paterson*’s quotations. The passage enacts the separation and translation of ekphrasis, and, moreover, in describing a self-consciously ethnographic image, literalizes the interarticulation of race and ekphrasis that Mitchell proposes, presenting for view the bodies of nine African women:

I remember
a *Geographic* picture, the 9 women
of some African chief semi-naked
astraddle a log, an official log to
be presumed, heads left:

Foremost
froze the young and latest,
erect, a proud queen, conscious of her power,
mud-caked, her monumental hair
slanted above the brows—violently frowning.

Behind her, packed tight up
in a descending scale of freshness
stiffened the others

and then . . .
the last, the first wife,
present! supporting all the rest growing
up from her—whose careworn eyes
serious, menacing—but unabashed; breasts
sagging from hard use . . .

Whereas the uppointed breasts
 of that other, tense, charged with
 pressures unrelieved .
 and the rekindling they bespoke
 was evident.

Not that the lightnings
 do not stab at the mystery of a man
 from both ends—and the middle, no matter
 how much a chief he may be, rather the more
 because of it, to destroy him at home .

. . . Womanlike, a vague smile,
 unattached, floating like a pigeon
 after a long flight to his cote. (13-4)

Although the passage describes a picture, it does not do so in strictly visual terms; in this manner it materializes immaterial things and, at the same time, withdraws into itself. From Williams's description we learn that the nine women in the photograph are in a line, "heads left"; that they are "sti[fff]"; that one is adorned with large hair, mud, pointy breasts, and a frown; and that another has sagging breasts and menacing eyes. We also learn that they are sitting on a log. These are descriptions of the visible. We learn, further, of something notionally visible, but absent: that the women are the wives of "some African chief" who is not in the frame. And we learn, too, of invisible things that are occurring in this scene, conceived not as a still image but as a portal into a distant reality; it is in this sense that the image recuperates the unknowable. The eldest woman somehow supports all the others. Meanwhile, the youngest woman is "proud" and "conscious of her power"; her breasts are "charged with pressures unrelieved," perhaps the pressure of breast-milk, proposed to explain the gravity-defying "up-point[ing]" of the breasts. Indeed, the youngest woman's breasts are proof of something, a sign; "the rekindling they bespoke/was evident." The description concludes with a moral, the claim that the unseen husband is subject to violence at the hands of his "menacing" wives, and finally with a purely unvisualizable "unattached" "vague smile."

The scene not only arrays its own notional content (what Barthes would call its *studium*) in mute visibility but also visualizes a number of elements from Book I that are otherwise scattered, laying them out in a tableau of material persons and objects. One of the most salient of these is the abstract notion of marriage, one of the great concerns of the discipline of anthropology, which, for Williams, also registers epistemologically as contact, the haptic knowledge to which I have alluded; semiotically as the success of language; and sexually as consummation. Marriage and its consummation are punningly, but also seriously, identified with an embodied "knowledge," a knowledge of contact that conduces

to organic, rather than mechanical, reproduction.²⁰ Indeed, when we first meet Paterson, the man who is a city, we are immediately drawn into his erotic life:

A man like a city and a woman like a flower
 —who are in love. Two women. Three women.
 Innumerable women, each like a flower.

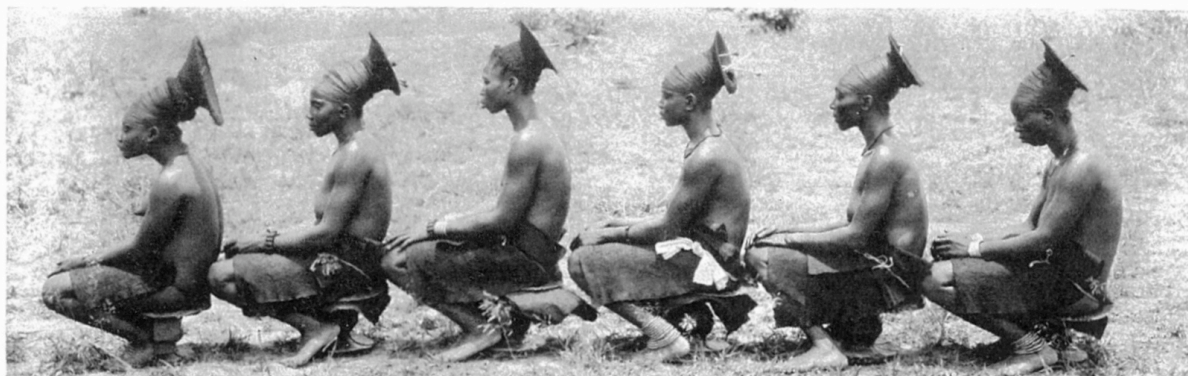
But

only one man—like a city. (7)

Figuring, and gendering, two different ways of being numerous, this moment insists on the possibility of fluid movement and even equivalence between the one and the many, each of the dashes indicating what amounts to an argument. The man like a city is multiple because, as Walt Whitman might put it, he contains multitudes; although he is “only one man,” the dash lets us pause for a moment before we are led to the reminder that undercuts the man’s unity; he is “like a city.” Juxtaposed with her, he seems to point up the flowerlike woman’s simplicity, until the sentence concludes that they are “in love,” proposing compatibility and, at some level, equivalence between the simple woman and the multiple man. As it turns out, the woman is also multiple, in a different way, because there are many like her; as the ordered listing of numbers suggests, she belongs to a potentially infinite series. The compatibility of the internally multiple Paterson with a series of flowerlike, indistinguishable women is the compatibility of two fundamentally distinct forms of multiplicity, a marriage of individual and type.

It should of course be obvious that the image also repeats an oppressive gender model, in which the male is individual and complex, the female typed and simple, but what I wish to point out here is the way in which the *National Geographic* photo repeats this idea, with its one man and its nine women, lined up serially like objects, “packed tight up/ in a descending scale of freshness.” It is as an enactment of *Paterson*’s broader interest in marriage, divorce, and knowledge that the wives’ aggression in the passage becomes legible; the women, themselves skewered on a log, “stab at the mystery of a man/ from both ends—and the middle.” The women in this photograph, from the “violen[t] frow[n]” to the “menacing” eyes, are frightening, powerful, aggressive, even as they gesturally evoke the consummation of marriage, as they all squat together on the same “official log.” Presented as serial objects, the women nonetheless seem to possess a solidarity, even unity, as the eldest, first wife “support[s]” the others, “growing /up from her” like an organic appendage, a phallus that parallels and competes with the “official log.” Seriality here becomes confederation, even unity of action. Its organic solidity undercuts the mechanical reproduction that seriality at first calls up, just as the “many flowers” of the opening passages must grow out of the ground as well as resemble one another. The ekphrastic rendering of the photograph re-presents marriage, less as a coupling than as an energetic union in which the final element in the series, the youngest woman, can “gro[w] up from” the first. This model of energetic, organic transfer, moreover, itself comments on the

ekphrastic process unfolding before us; though Williams presents us with a photograph, the paradigmatic “work of art in the age of its technological reproducibility,” the very reproduction of the photograph, first in a magazine, then ekphrastically, succeeds in transferring an originary presence to our view.



THE “BETTER HALVES” OF A MANGBETOU CHIEF, LINED UP IN ORDER OF PREFERENCE; THE LADY WHO LEADS THE PROCESSION IS ALSO SHOWN IN THE ILLUSTRATION ON PAGE 715

were minute
issuing from
They take flight
reproduce, the
the water.
The natives
make a paste, w
is considered a
DOWN LAKE
MAD
Down the
Nyasa we tra
after eight m
through swam
ers and jung
brought us the
of salt air. I
screen of palm
line of the Ind
zambique.
We lingered
seaport of J
Africa, only
passage for M
ing at Majun
way across the
bush, and rice
between the w
narrative, the
were well rece
error.
After a shor
for Tamatave,
whence we took
the north end
to Majunga b
rades, who h
Mombasa and
Madagascar
France, Belgi
combined and
about 3,400,00
minerals, timbe
products and o
field for devel
While, with
big island our
was nearing an
our Expedition
complete. Ou
be accomplish
given to the v
our experience.
We had obtai
feet of extr

Figure 11. Fig. 1. The *Geographic* picture: the wives of a Mangbetu chief. *National Geographic Magazine*, June, 1926.

Yet there are also two gestures of deferral in Williams’s presentation of the photograph, which again frame the presence of the photograph in distance. First, why must this picture be named as a photograph from *Geographic*? And second, why does it appear as the ghostliest of images, a memory? *Geographic* is of course *National Geographic*, and Christopher MacGowan, following Mike Weaver, identifies the photograph in question as a June 1926 image of six Mangbetu women sitting in a row, not on a log but on stools, facing left (Figure 11). As Catherine A. Lutz and Jane L. Collins observe, like a middlebrow version of the anthropological photograph, “the *National Geographic* photograph is commonly seen as a straightforward kind of evidence about the world—a simple and objective mirror of reality” (xiii), even though, as the magazine’s title suggests, the periodical is both *Geographic* and *National*, pertaining to an American vision of a world beyond its borders. As Tamar Rothenberg argues, “[l]ike its popular—and for-profit—magazine compatriots, *National Geographic* helped to articulate a particularly American identity for Americans...an American identity in opposition to both old Europe and primitive non-Western regions” (5), a kind of Americanness that might be familiar from Williams’s conception of the local and from the vision of American culture espoused by New York intellectuals like Randolph Bourne. Although American anthropology began to treat ethnographic images with some suspicion as it professionalized in the early twentieth century (MacDougall 282-3), beginning in 1905 *National Geographic* embraced images of the far-away as the foundation of its house style (Lutz and Collins 27).²¹ *National Geographic*

operated “on the boundary between science and pleasure”; as a form of popular science, legitimated in part by the contributions of prominent anthropologists, including Franz Boas, the magazine was, as Lutz and Collins point out, able to “speak with the voice of scientific authority, while remaining outside of and unconstrained by the scientific community” (24).



Figure 12. The iconic picture of Nobosodrou, from the book *La Croisière Noire*.

It is therefore perhaps unsurprising that the photograph to which Williams alludes similarly belongs to a hybrid instance of popular ethnography, the Citroën Central African Expedition, what became known as *La Croisière Noire*, or the “Black Journey.”²² *La Croisière Noire* was a 1924 motor expedition across central Africa, organized by André Citroën, the French car-maker, and featuring Citroën vehicles. Also included on the journey were French government officials; scientists, including representatives from the Geographic Society and the American Museum of Natural History; and (of course) filmmakers. Part spectacle, part ethnographic adventure, part advertisement, the Black Journey became the subject of a wildly popular feature-length documentary by Léon Poirier, several short films, an art exhibition, various kitsch, and a variety of magazine and journal articles, including the one in the June 1926 issue of *National Geographic* (Berliner 190). The material traces of the *Croisière Noire* reveal the iconicity of the Mangbetu woman (Figures 12-15). The women

in the photograph remembered in *Paterson* are not just any women; they are international icons of black femininity, particularly Nobosodrou, the woman furthest to the left in Williams's picture, whose image achieved a Black Venus status nearly on par with that of Josephine Baker. It is of this particular woman whom Williams writes, "Foremost/ froze the young and latest,/ erect, a proud queen, conscious of her power...."



Figure 13. Nobosodrou rendered as an advertisement for the Exposition Coloniale, 1931.



Figure 14. An ash-tray commemorating the *Croisière Noire* depicting a Mangbetu woman (probably not Nobosodrou).



Figure 15. A Citroën hood ornament commemorating the *Croisière Noire*, sculpted by Frédéric Bazin.

Even outside of the ubiquity of Nobosodrou's image, the Mangbetu woman, with classically styled hair and elongated forehead, had long been a favorite subject of western photography, prompted in part by what Enid Schildkrout has called the "Mangbetu myth," initiated by the nineteenth-century botanist Georg Schweinfurth. Schweinfurth's characterization of the Mangbetu as a uniquely noble, aristocratic, and "civilized" society among colonial Africans, as well as perhaps racially Semitic, was perpetuated well into the 1950s, making the Mangbetu a favorite subject for photography (Geary and Pluskota 84-5). These images were as comforting as they were exotic, as Western as Congolese. The *National Geographic* photo therefore calls up, as a non-citational poetic image might not, a broad network of interactions between the near and the distant, which are made somehow both more and less real for existing as part of popular culture—less scientifically legitimate, in the senses in which we usually imagine scientific legitimacy; and yet more authentically cultural because more popular. A *National Geographic* photo is distanced from the scene of Paterson, New Jersey, and yet not distanced, because there is nothing so familiar as *National Geographic*. The promiscuously circulating image of the Mangbetu women provides the attenuated, regulated presence necessary to, as Williams writes, "evok[e] [the unknown] solidly"—to, in other words, embody the knowable world (*Embodiment* 131).

The photographic transfer of presence is only extended by the second deferral I mentioned above, that of memory: "I remember a *Geographic* picture." This act, the remembering of a photograph, revives the question of the photograph's status. For as Barthes suggests, the photograph verifies the this-has-been, the having-been-there of the photographer (47),²³ and thus acts as a witness, a proxy for memory itself. Indeed, classical accounts of memory as a kind of physical impression of experience on the wax tablet of the mind are strongly evoked by the theory of photography that understands it as an etching of reality onto film.²⁴ This understanding, however compromised by our conviction that there is no such thing as uncoded representation, persists to produce a sense of the real that, Williams suggests, is in itself a form of knowledge. The remembered photograph is therefore a recollection of a recollection, the transfer of presence from the thing photographed to the film, printed and circulated in popular culture, and *then* impressed upon the memory, finally emerging as "lines" "squeeze[d]...up into pictures." If *Paterson* is, as Williams complained to Ginsberg, a poem with "no form," it is one that relies instead on the sequences of physical impression that make the image, sequences that necessarily encode a distance in the local, proximity deferred.

III. The Delineaments of the Giants: Ekphrasis and the Line

This very formlessness returns us again to the fundamental unit of poetic form, the line: the form of ekphrasis, here given as a sequence of touches, itself constitutes an organic linear series.²⁵ *Paterson*, as I have been arguing, calls attention to complexities implicit in the very notion that the line constitutes a form. Ekphrasis always proposes a translatability between the visual and the verbal by marking a difference between the two, yet the logic of contactual sequences by which Williams's ekphrasis operates suggests not

only translatability but a recursive formal constitution. Poetic lines, themselves constituted by mere sequence, then semantically produce the memory of the circulated photograph of—what else?—a line. When (poetic) lines are pushed into pictures, i.e. via ekphrasis, they thus not only semantically render a visual image but also call attention to their own plasticity, their own formal status as sequences, taking their place in the linear sequence of touching that confers a formless form on *Paterson*.

Paterson's insistence on a translatability between the poetic line and the visual line suggests that closer attention to the moment of translation itself is warranted. And indeed, in the instance of the *National Geographic* photo, there are significant differences between the photograph referenced and the one described in the poem. These differences are worth examining, not because the truth of the poem can be located in the *National Geographic* photograph, but rather because the action of turning lines into pictures and pictures into (poetic) lines lies at the center of *Paterson*'s ethnographic logic of presence.²⁶ As the photograph is transmuted into poetry, it undergoes two salient changes that themselves insist on a metamorphosis from pictures into lines. First, Williams augments the number of women pictured, from six to nine. Second, he seats the women on a log rather than on stools. These are, it will be observed, revisions that indulge fantasies of the primitive: the exoticism of multiple wives is increased by fifty percent, and the women are no longer seated on crafted furniture, but rather, now, on an uncrafted object, a log.²⁷ But they are also revisions that extend and emphasize the horizontal line that the women form, creating a longer series connected horizontally by a single physical object. In this way, the moment of ekphrasis revalues the feminine seriality that continually reappears in the poem as, in fact, the *constitution* of the line, the fundamental unit with which we began and into which the poem must inevitably resolve. For the women, now "packed tight up" rather than sitting each on her separate stool, seriality is rendered organic and energetic, with the series of wives "growing/ up from" the first wife, as if in consequence of her strength. In contradistinction to the mechanical reproducibility of the photograph, and of related *Croisière noire* kitsch objects (an ashtray, a hood ornament), the poem proposes lines that are capable of encapsulating unseen power—"lightnings," perhaps (14), or "the unknowable." The gestures that evoke the primitive, in other words, simultaneously work to render "the unknowable" concrete and subject to knowledge, even as the unknowable is "abjure[d]" in favor of what is concrete—the this-has-been, the memory, the photograph, the object.

The nature of the log on which the women sit is also worth noting, not only because the log does not appear in the photograph but because the poem insists and even speculates on it: it is "a log, an official log to/ be presumed" (13).²⁸ The aside, "an official log/ to be presumed," perhaps suggests a patronizing smile over the possibility of a mere log serving as an "official" accoutrement. But the strange belaboring of the log, together with the interest in sequences that permeates *Paterson*, also points to another reading. The photograph of the women appears in a *National Geographic* essay chronicling the *Croisière Noire*, an essay itself singularly "formless," in that it ticks off locale after locale as the authors travel along, like an official log of events.²⁹ In the official log, events of no

particular conceptual relation to one another are juxtaposed by the logic of their temporal contiguity, dramatizing the minimal linear order and spatiality that the passing of what Walter Benjamin has famously called “homogeneous, empty time” always imposes on history (“On the Concept of History” 395).³⁰ Thus the “official log” of the (described) photograph binds the implicitly temporal sequence into which the women are arrayed, “packed tight up/ in a descending scale of freshness” (that is, of youth). It thereby brings into relief not only the organicity with which the women ultimately join but also the *process* by which a log-book logic of recording time may juxtapose disparate individuals (the scowling Nobosodrou, the careworn first wife) in a temporal-spatial sequence of contact. And rather than decry the logic of the logbook, Williams celebrates its near-arbitrariness; paradoxically, in mechanistically and arbitrarily arraying events in sequence, the logbook produces a minimal form of extraordinary plasticity, the line.³¹

If I am making much of this log, it is only because *Paterson* does so itself. Indeed, a few pages later in the poem, Williams brings the log back to insist again on the connectedness of the line of women, and, moreover, the knowledge of the local that this ostensibly far-away image can bring. As Williams describes it, the eldest woman is

on a log, her varnished hair
trussed up like a termite’s nest (forming
the lines) and, her old thighs
gripping the log reverently, that,
all of a piece, holds up the others—
alert: begin to know the mottled branch that sings . . . (*Paterson* 21)

Once again the log, nonexistent in the referenced photograph, not only reappears but is emphasized, specifically in its capacity of binding the women together, “forming the lines” and *thereby* beginning to “know” the smallest of local details, a certain branch that hangs over the Passaic Falls. The poem’s fixation on the log suggests that the log plays the role of the photograph’s *punctum* in the poem, the guarantor of presence that declares, “this has been.” For as the poem returns to the log, after the initial description of the photograph, Williams begins to interweave mentions of the log with the image of tree branches and bushes by the Passaic River, logs and branches native to *Paterson* that are guarantors of its local reality: “a willow twig pulled from a low/ leafless bush” (18), “a short, compact cone [tree]” (19), “one/ mottled branch” (20). The this-has-been of the photograph, the phantom log, becomes conflated with the this-has-been of the locality, the branches along the Passaic that themselves are signs of fertile consummation; the far is thus drawn into the near. That the log never appears in the actual photograph, but is instead a part of the photograph that is “remember[ed],” signals a deeper investment in the processes of transfer than in any straightforward realism, for, as Barthes writes, “I may know better a photograph I remember than a photograph I am looking at, as if direct vision oriented its language wrongly, engaging it in an effort of description which will always miss its point of effect, the *punctum*” (53). The inevitable muteness of the photograph can only be overcome in the photograph’s absence; the impossibility of ekphrasis (that is, the impossibility of making present an absent image) is made a possibility precisely when the image is absent. In this

manner Williams performs the absolute separation of abjuring the unknowable and, in that separation, creates the conditions for rendering the unknowable knowable. Through the elaborate protocols of mediation implied by ekphrasis, here given as renditions of the ethnographic image, an immediacy more reliable than mere sensation may be produced. It is in this reliance on the protocols of mediation, the method by which it abjures the unknowable, that the poem may be understood as experimental. The formless plasticity of the line as a component of the poem, the quality that makes it possible to squeeze the lines up into pictures, models the plasticity of Paterson as a site. At the same time, the ekphrastic gesture itself produces sequences of deferral that energetically touch, reproducing, in the end, the line again, but with a difference. For the series of women, stabbing like lightning, or the series of flowers, or indeed the series of inhabitants of Paterson, New Jersey, who are “listed,” Williams informs us, “in the Telephone/Directory” (10)—these are series rendered as ordered sequences, lines *formed*, repetition that does not repeat so much as accumulate and gather force. It is in this dynamized seriality, produced by embedding distance in the local, that we can apprehend the logic of *Paterson*’s formless form. Thus *Paterson* the poem, as a potentially interminable sequence of books that Williams continued to work on through multiple strokes up until his death, itself produces a line of touches, one that tracks the Passaic River down to the sea, and which must always go elsewhere in order to do so. The form of no form is the form of a line, and it is through the written poetic line that Williams constructs that mediate immediacy, personality writ large, a line squeezed up into a picture, “an image large enough,” as Williams writes, “to embody the whole knowable world about me.”

That the image must “embody the whole knowable world” helps to explain the subtitle of Book I, “The Delineaments of the Giants.” The word “delineaments” blends “lineaments,” bodily (usually facial) or topographical features, with the action of delineation; “delineament” itself is listed as obsolete in the *Oxford English Dictionary* (“Delineament”). Book I “introduces the elemental character of the place,” as Williams puts it in his prefatory note (*Paterson* xiv); indeed, it *sketches* or *outlines* the person-place of Paterson by rendering his body in lines, poetic lines that are “delineaments.” This usage brings the line into relief as a structuring, delimiting form—that which, indeed, makes form possible. And yet, this reading of the “line” is necessarily metaphorical, because the lines with which Paterson is sketched are poetic, ekphrastic rather than directly visual. We “see” Paterson not visually but semantically, as those sequences of words describe the “spent waters” of the Passaic Falls “forming the outline of his back” (*Paterson* 6). Thus, as I have insisted above, the line—like ekphrasis itself—is also a form of no form, because its logic need not be semantic or causal, but merely proximal. The line privileges presence and proximity over narrative, meaning, psychology, or causality, even as it always invites the projection of narrative. The basic facts of reading in English—that it is bound in time and that it conventionally takes the form of a line, one word after the next—imposes an order.³²

Williams’s concept of “measure” helps to elucidate the import of the line—temporal, visual, poetic—for *Paterson*’s epistemology and for Williams’s poetics generally. “Measure” is the term that Williams used for discussing rhythm, as a replacement for

“meter,” which he considered moribund.³³ As Stephen Cushman has so painstakingly demonstrated, “measure” for Williams is both a formal scheme and a trope (93ff). Here I wish to point up the interrelatedness of these two aspects of measure in *Paterson*, for by slipping between form and trope, Williams calls on the line to enact the transfer of presence to which he constantly alludes. In a 1955 letter to John Thirlwall, Williams explains that “the structure of the poetic line....is where aesthetics is mated with physics,” articulating once again the poetic commitment to the material and the palpable. Repeating the renunciatory gesture of abjuring the unknowable, Williams writes,

The first thing you learn when you begin to learn anything about this earth is that you are eternally barred save for the report of your senses from knowing anything about it. Measure serves for us as the key: we can measure between objects; therefore, we know that they exist. Poetry began with measure, it began with the dance, whose divisions we have all but forgotten but are still known as measures. (*Selected Letters* 331)

A sense of prohibition (“eternally barred”) continues to surround knowledge; just as in “no ideas but in things,” knowledge is proscribed and then readmitted through the exception of physical presence. The renunciatory terms in which Williams describes poetic measurement suggests that it, like place, works to materialize what is otherwise inaccessible—a concrete bodily “measure” that is also implicitly able to access the quality of the body dynamized in dance. Moreover, as A. Kingsley Weatherhead has pointed out, Williams also elides the distinction between temporal and spatial measurement in this moment (Weatherhead 122), reenacting the ekphrastic translations of *Paterson*. In calling upon measurement as a refuge from unreality, Williams evokes the distinction set up in Plato’s *Republic* X between the “trickery” of artistic mimesis and the reliability of measurement: “measuring, counting, and weighing give us most welcome assistance...so that we aren’t ruled by something’s looking bigger, smaller, more numerous, or heavier, but by calculation, measurement, or weighing” (1207). This moment appears as part of the infamous banishment of poetry from the Republic; in the dialogue, Socrates argues that poetry’s status as representation makes it deceptive and inferior to physical measurement. In subjecting the line to measurement, Williams seeks to undercut that distinction, proposing the possibility of a real re-presentation. Thus, as he writes a moment later, “[t]he verse I can envisage, a measure infinitely truer and more subtle than that of the past, comes much closer in its construction to modern concepts of reality” (*Selected Letters* 332).³⁴ Measure carries with it the promise of presence because the act of measurement itself distills a physical object into metrics that reliably re-present it, just as history may be recorded (and reduced) into an “official log” that marshals the logic of proximity into an authoritative formlessness, given not in the terms of *what* but of *how much*.

Spatial measurements have historically been determined by reference to the human body (the cubit, the inch, the hand, the foot); likewise, Charles Olson famously reconceived poetic measurement in terms of human breath in 1950, between the publication of Books III and IV of *Paterson* (“Projective Verse”). Supplanting accentual-syllabic feet with what he calls a “musical *pace*” (*Selected Letters* 326, my emphasis), Williams

envisions poetic measurement as dictated by a body in motion, an embodiment that makes the line, confirming Weatherhead's observation that Williams at times understands temporal measurement in spatial terms. Natalie Gerber has persuasively argued that Williams's "beats" are not strictly rhythmic, but rather correspond to what linguists call "intonational phrases," which "tend to occur where structural pauses can be inserted within speech" (Gerber 180). In a letter to Richard Eberhart, Williams gives an example of his "musical pace," taken from the late poem "To Daphne and Virginia," which treats each line as a "beat," with a pause at each line break (*Selected Letters* 326). As Gerber points out, these speech-like "intonational phrases" are not altogether determined by syntax or semantics; the *possibility* of inserting pauses, however, *does* depend on syntax and semantics. In other words, while it is Williams who chooses where to break a line, with semantic consequences, he can only choose from a finite number of options, which are dictated by linguistic rules. The ostensibly physical, rhythmic construction of the line, described in the bodily terms of "breath," "music," and "dance," thus turns out to be intimately bound up in—and in part determined by—meaning, amounting to what Cushman has called a "phenomenological" prosody (22). The construction of the line as a form of no form hinges on its ability to render meaning *as* measure, materializing and re-presenting the things being described (say, a *Geographic* picture) as formal units. Take, for instance, a passage that still, though now obliquely, alludes to the women in the photograph, comparing them to flowers:

Which is to say, though it be poorly
said, there is a first wife
and a first beauty, complex, ovate—
the woody sepals standing back under
the stress to hold it there, innate

a flower within a flower whose history
(within the mind) crouching
among the ferny rocks, laughs at the names
by which they think to trap it. Escapes!
Never by running but by lying still— (21-2)

Here, line breaks appear in non-obvious places; the lines clearly are not end-stopped, and therefore are not determined by the strongest syntactic constraints. The constraints of the passage are largely accentual-syllabic: the lines continually dance around, and in places unabashedly take the form of, iambic pentameter. The passage is thick with such near misses as "the woody sepals standing back under" as well as the more stable "a flower within a flower whose history," "among the ferny rocks, laughs at the names," and "Never by running but by lying still." Lest "measure" here simply amount to a slightly modified accentual-syllabic meter, however, we should note the moments in which iambic pentameter is ostentatiously rejected: "Which is to say, though it be poorly/ said" (21 ll. 21-2) and "under/ the stress to hold it there, innate" (21 ll. 24-5). In these moments, line breaks deliberately disrupt not only the pentameter but also syntax, dividing an adverb

from its object and splitting up a prepositional phrase. Iambic pentameter here is strenuously disrupted even as it is invoked.³⁵

But in spite of the few above-mentioned exceptions, generally, as Gerber proposes, line breaks occur at natural syntactic breaks—sometimes the ends of clauses, but more frequently just before a prepositional phrase or a conjunction, breaks that are natural yet weaker than breaks that would occur between sentences or clauses. The lines are thus constructed through the play between rhythm and syntax. Given that syntax has considerable impact on meaning in twentieth-century English (unlike in synthetic languages like classical Latin), it is significant that Williams restricts line breaks to coincide with minor syntactic breaks. Measure binds accentual-syllabic rhythm to semantic and syntactic properties, rendering the line as a tense interaction between physical, even bodily features and abstract meaning. For while the lines are themselves syntactic sequences, bound by a resistance to and play upon iambic pentameter, they also form semantic-rhythmic units that appear in a sequence moving down the page. The sequence of lines is itself a line of images, juxtaposing a “first wife” with a “first beauty,” and then “woody sepals,” laying the line of women from the photograph next to the flowers of *Paterson*’s opening passages. The same argument, of course, could be made for any poem; this is by definition, since the line is an absolutely minimal form; indeed, in some sense that is the point. But the lines of *Paterson* insist on the primacy of sequence and measure over other formal determinants, especially in those moments when they actively invoke that most canonical of meters, iambic pentameter, in order to violently disrupt it. Williams’s idiosyncratic understanding of poetic “measure” and the line, so influential to generations of later American poets, does what ekphrasis tries to do, and what field-work tries to do: to transfer presence, to bridge an unbridgeable gap that it has itself created, to serve as a reality-reflecting form of no form, and thereby to make possible an embodied knowledge.

IV. Without Invention Nothing is Well Spaced

Knowledge is trouble in *Paterson*. It is the poem’s highest desideratum, but it is elusive, and comes at a price. It can only be acquired through the renunciations entailed by anthropology, by localizing to a specific site, to “something knowable,” as Williams describes the city (*Paterson* xiii). Like the artifact-collecting, skull-measuring, site-visiting Boasians, *Paterson* “abjures the unknowable” in favor of the knowable, which is the material. It is not, as Clark Lunberry suggests, that the poem supposes Paterson, New Jersey to be stable and fixed (Lunberry 651), but rather that it is only a stable and fixed Paterson that can be *known*, at a steeply reckoned cost that the poem acutely registers. This renunciation is a form of scientific self-discipline and an ethical commitment, as I suggested at the beginning of this chapter, and not an easy one. “No ideas but in things” is a painful avowal, and the speaker must be commanded to “[s]ay it!” (*Paterson* 9). Knowledge, in *Paterson*, must be material and present: it is therefore also the occasion for regret, and for desire. The fundamental loss that underwrites *Paterson*’s epistemic security surfaces over and over in the elegiac tone that pervades even the poem’s most energetic

moments. “Divorce is/ the sign of knowledge in our time,” comes the lamentation—“divorce! divorce!” (*Paterson* 17). The contact and organicity made possible by (serial) marriage, a figure for the transfer of presence, always threatens to dissolve into divorce, the insistent separation between the knowable and the unknowable, metaphorized as a flower-bud separated from its branch:

a bud forever green,
tight-curved, upon the pavement, perfect
in juice and substance but divorced, divorced
from its fellows, fallen low— (17)

The permanently unopened bud contrasts with the flower-like women who grow organically out of the “official log,” each a wife, each aging in her own time. The sterile separation of divorce is what “no ideas but in things” becomes when things are no more than things—when, unlike the primitive, the thing cannot “evok[e the unknown] solidly” (*Embodiment of Knowledge* 131) or function as a conduit of presence. Boasian anthropology secures knowledge by establishing an absolute other that the anthropologist then makes present. If the poem likewise secures knowledge by abjuring the unknowable and setting up chains of contact that serve to convey presence, then divorce is the sterile threat that is always embedded therein, a stuttering, fragmentary quality and source of anxiety (“I don’t even know if Paterson is poetry”) on which knowledge depends: “Divorce (the/ language stutters)” (*Paterson* 21). If, as Cushman has argued, *Paterson* “must avoid disintegrating into a sequence of fragments,” it is only because the sequence of fragments is the dangerous condition that underwrites presence (100).

Paterson’s sense of the real is achieved by an ethical self-policing with extensive formal consequences. The line of *Paterson*, so often cited as influential to the Beats, the Black Mountain poets, and others, secures knowledge by being, itself, unstable, always ready to mutate into an ekphrastic picture, and thence into a photograph. As a form of no form, the line teeters on the brink of a primordial formlessness that offers the fantasy of an utterly unmediated reality—of presence relayed. As such, the line is, like the picture, “annoyingly mute”; *presence* is annoyingly mute, because, as Gumbrecht argues, it does not *mean*. In its muteness, presence is a refusal-to-say and a renunciation of the unknowable; forms of no form, like the line, the mute image, or the punctum, relay presence and signify reality insofar as they do not amount to discourse (Barthes 53, 55). “Nothing surprising, then,” Barthes writes, “if sometimes, despite its clarity, the *punctum* should be revealed only after the fact, when the photograph is no longer in front of me and I think back on it... however immediate and incisive it was, the *punctum* could accommodate a certain latency (but never any scrutiny)” (53). This accounts for one of the great contradictions of *Paterson*: that its form is at once terribly influential and terribly elusive. Working at the level of the sequence, Williams constructs the local as a nearness always routed through deferral, through the photograph of the primitive, through ekphrasis, and through the conflation of man and place. As Williams writes in Book II of *Paterson*:

Without invention nothing is well spaced,
unless the mind change, unless

the stars are new measured, according
 to their relative positions, the
 line will not change, the necessity
 will not matriculate: unless there is
 a new mind there cannot be a new
 line, the old will go on
 repeating itself with recurring
 deadliness... (50)

The passage registers an urgency about establishing a poetic measurement adequate to the reality of modernity, framed repeatedly in the terms of negation: without this, there will be no that. The repeated negations impart an anxiety and a sense of imperative; the dangers of a poorly spaced world and the persistence of the old line include a “deadliness” that must be deflected. The ethical imperative embedded in this injunction to measure is unmistakable. In this, Williams echoes a moment from his early poem *The Wanderer* (1914), one that clearly invokes Whitman’s great poem of presence, “Crossing Brooklyn Ferry”:

But one day, crossing the ferry
 With the great towers of Manhattan before me,
 Out at the prow with the sea wind blowing,
 I had been wearying many questions
 Which she had put on to try me:
 How shall I be a mirror to this modernity? (*Collected Earlier Poems* 3)

By the time of *Paterson*, Williams had determined that to mirror modernity was to enter into its scientificity, to measure and make present the material world—a world always both near and far.

Notes to Chapter Five

¹ Whitman 310; Stein 17.

² These are Claude Lévi-Strauss’s terms.

³ Mitchell offers a striking example: “Everyone knows that a photograph of their mother is not alive, but they will still be reluctant to deface or destroy it” (*What Do Pictures Want?* 31).

⁴ Abstracted, Barthes’s *studium* and *punctum* map roughly onto a tension that Gumbrecht sees in all art works between “meaning” and “presence” (Gumbrecht 77, e.g.). Both Gumbrecht and Nancy argue that presence is radically temporal, always short-lived and never predictable or retrievable, a suggestion with which Barthes’s language for describing the “wounding” action of the *punctum* (“sting, speck, cut, little hole—and also a cast of the dice”) shows a happy concordance (Gumbrecht 58, Nancy 4, Barthes 27).

However, Barthes explicitly notes that not all photographs have a *punctum* (Barthes 41). I prefer the narrowness of Barthes's account.

⁵ This difference notwithstanding, the similarities between Bazin's and Barthes's accounts are striking, as Jean-Michel Rabaté points out (9).

⁶ The "form of no form" borrows the anthropologist Sharon Trawick's phrase "the culture of no culture," used to describe the culture of high energy physics researchers (162).

⁷ Anthropology's status as a science was and remains highly contested, a fact that tended to make Boasian anthropologists highly conscious of method.

⁸ Although here and elsewhere in this talk I will be using the comparativists as a foil for Boasian anthropology, as Stocking points out, it would be unfair to caricature the so-called "armchair anthropologists" as unconcerned with the quantity and quality of their data (17).

⁹ Although he does not specifically address the role of anthropology in bringing it into the mainstream, Walter Benn Michaels has sharply critiqued the notion of culture, especially for the ways in which it enables complacency with respect to class inequality.

¹⁰ The many failings of this particular antiracist approach have been amply recorded and analyzed within the discipline of anthropology itself; see in particular [references].

¹¹ See, for example, Molloy.

¹² See also Molloy 140-1 and the essays collected in *Modernist Anthropology*, ed. Manganaro. As Molloy points out, Walter Benn Michaels takes up the same themes in *Our America*, although he largely ignores anthropology as a discipline in that volume. The same, in fact, may be said of Brian Bremen's *William Carlos Williams and the Diagnostics of Culture*.

¹³ In the interests of clarity, I wish to point out that the Boasians did not by any means consider the study of myth off-limits; in contrast with the comparativists, however, the Boasians rooted that study in site-specific field work. See, for instance, Boas, "Tylor's 'Adhesions' and the Distribution of Myth-Elements" and "The Mythology of the Bella Coola Indians," in *A Franz Boas Reader*.

¹⁴ I have significant reservations about Gumbrecht's argument, though I find it useful for understanding presence in Williams.

¹⁵ An obvious extension of this argument would be to suggest that anthropological method itself owes its own epistemic security in part to the primitivism so evident in Benedict's writing, for instance. Anthropological method was and remains highly contested and self-reflective, however, and these dimensions of the history of anthropology have already been admirably addressed within the discipline. Since Williams is a poet and not an anthropologist, however, I believe that examining *Paterson* opens up a literary dimension to these questions not hitherto widely discussed, largely because epistemic security is rarely thought to be a literary question in the first place.

¹⁶ That is, to construe Paterson as "local" is already to distance oneself from it.

¹⁷ Cf. Rony 7.

¹⁸ This exception occurs on p. 137 of the MacGowan edition, where lines are slanted at angles.

¹⁹ The notion that pictures are the “primitive” of writing, especially phonetic writing, is most famously advanced in Ferdinand de Saussure’s *Course in General Linguistics*, and deconstructed in Derrida’s *Of Grammatology*. I should note that, Derrida’s influence notwithstanding, there remains a “spontaneous linguistics” in critical discourse that construes the pictorial image as a primitive form of writing.

²⁰ That knowledge is, or ought to be, located in marriage is sometimes declared in the breach, as in the lament that “Divorce is/ the sign of knowledge in our time” (17).

²¹ To clarify: *National Geographic* was founded in 1888 and began printing a high volume of images in 1905 (Lutz and Collins 16, 27).

²² In some translations, the “Black Rally” or the “Black Cruise.” Dreadfully, Citroën also sponsored a trip across Asia known as the *Croisière jaune*, and a trip across North America known as the *Croisière blanche*.

²³ Barthes makes this suggestion specifically with respect to what he calls the *punctum*, a detail that “pricks” the viewer, neither formally nor as a sign, but rather emotionally.

²⁴ See Aristotle, *De memoria et reminiscencia*. On the ontology of the photographic image, see André Bazin’s essay.

²⁵ As W. J. T. Mitchell observes in *Picture Theory*, ekphrasis generally is not a *form*; it is constituted by its content alone (page). Williams’s ekphrasis, which takes the form of a sequence of presences (memory, magazine image-world, photographer) is therefore unusual in that it does propose a form for ekphrasis—albeit what I have called the linear “form of no form.”

²⁶ In discussion, David Landreth raised the possibility that the photograph is misremembered in *Paterson*. It seems to me that in the capacity of transferring presence, a faulty memory is as authoritative as an accurate one.

²⁷ I am grateful to Namwali Serpell for this observation.

²⁸ I am grateful to Dan Blanton for observations on the “official log.”

²⁹ The book based on the *Croisière Noire* similarly suffered from a one-damn-thing-after-another quality, as an anonymous reviewer for the *American Journal of Sociology* commented:

This is an account, in romantic style, of an automobile trip across Africa, from Algeria to the Indian Ocean, a trip made apparently in the interests of French colonial policy and perhaps of French automobile makers. The book contains little to interest social scientists. It suggests that imperialism may take its way on caterpillars [automobiles with caterpillar tires], that there is a future for filling stations in Africa, and particularly that an immense amount of traveling can be done without seeing and reporting anything significant. To travel among little-known people without at all exploring them is a waste. (“Rev. of *The Black Journey*” 409)

³⁰ The notion of “homogeneous, empty time” alludes to Henri Bergson’s discussion of public and private reckonings of time in *Time and Free Will*.

³¹ While the “official log” has strong imperialist resonances that might tempt us to situate it as an undesirable medium of “homogeneous, empty time,” Williams is clearly interested in the “form of no form” that it is able to produce—a line—that perhaps resembles “homogeneous, empty time” less than it resembles another Benjaminian notion, the constellation. See Benjamin, “On Some Motifs in Baudelaire.”

³² As Hillary Gravendyk has persuasively argued, the linearity of reading is always disrupted by the simultaneity of perception, which is bound up in an attention/distraction dialectic. See also Crary, *Suspensions of Perception*. I do not by any means wish to reduce the importance of perceptual simultaneity in reading; rather, my concern here is to investigate the implications of the poetic line as a structuring device. It should be noted that, because present-day English is an analytic language, word order has profound semantic implications (unlike in, for instance, classical Latin, in which meaning depends more on morphology than on syntax). The line is therefore a particularly strong organizing principle in twentieth-century English.

³³ There is a substantial literature on Williams’s concept of measure; see, for instance, Bremen; Cushman; Funkhouser and O’Connell; Weatherhead.

³⁴ It may be worth noting that “modern,” in this instance, alludes specifically to a scientific quality, as the letter repeatedly makes parallels between the changed views of reality that modern physics demands and the changes that must be made to our understanding of poetic measurement.

³⁵ Williams’s metrical sense here is, I would argue, fundamentally different from those invocations of iambic pentameter that we see in, for instance, Eliot’s *Waste Land*. While both work in dialogue with iambic pentameter, in Eliot the pentameter is a comforting rhythm to which the poem continually reverts, sometimes in a way that suggests fear and regression into a state of “winter kept us warm,” whereas for Williams the pentameter is intentionally and almost violently invoked, only to be refused over and over.

Bibliography

- Adamowicz-Hariasz, Maria. "From Opinion to Information: The *Roman-Feuilleton* and the Transformation of the Nineteenth Century French Press." *Making the News: Modernity and the Mass Press in Nineteenth-Century France*. Ed. Dean de la Motte and Jeannene M. Przyblyski. Amherst: U of Massachusetts P, 1999. Print.
- Alcoff, Linda, and Elizabeth Potter, eds. *Feminist Epistemologies*. New York: Routledge, 1993. Print.
- A[llen], J[oe]l A[saph]. "Two New Popular Bird Books." Rev. of *Bird Studies: An Account of the Land Birds of Eastern North America*, by William E. D. Scott, and *Birds of the United States East of the Rocky Mountains: A Manual for the Identification of Species in Hand or in Bush*, by Austin C. Apgar. *The Auk* 15.3 (July 1898): 275-8. JSTOR. Web. 18 May 2009.
- Altieri, Charles. *The Art of Twentieth-Century American Poetry: Modernism and After*. Malden, Mass.: Blackwell, 2006. Print.
- Appadurai, Arjun. "Theory in Anthropology: Center and Periphery." *Comparative Studies in Society and History* 28.2 (April 1986): 356-61. JSTOR. Web. 11 February 2010.
- Aristotle. *Aristotle on Memory*. Trans. Richard Sorabji. 2nd ed. Chicago: U of Chicago P, 2006. Print.
- Armstrong, Tim. *Modernism, Technology, and the Body: A Cultural Study*. Cambridge: Cambridge UP, 1998. Print.
- Ashton, Jennifer. *From Modernism to Postmodernism: American Poetry and Theory in the Twentieth Century*. Cambridge: Cambridge UP, 2005. Print.
- Baird, S[pencer] F., T[homas] M[ayo] Brewer, and R[obert] Ridgway. *Land Birds*. Boston: Little, Brown, 1874. Vol. 1 of *A History of North American Birds*. 3 vols.
- Barker, Lewellys F. *The Nervous System and Its Constituent Neurones*. New York: D. Appleton, 1901. Google Books-Lane Medical Library, Stanford. Web. 8 June 2009.
- . "To Henry Knowler." 9 April 1902. The Alan Mason Chesney Archives. The Johns Hopkins Medical Institutions, Baltimore. Rpt. in Schoenberg 256-7.
- . "To Franklin P. Mall." 23 October 1903. The Alan Mason Chesney Archives. The Johns Hopkins Medical Institutions, Baltimore. Rpt. in Schoenberg 257.
- Barthes, Roland. "The Brain of Einstein." *Mythologies*. Trans. Annette Lavers. New York: Hill and Wang, 1972. Print.
- . *Camera Lucida: Reflections on Photography*. Trans. Richard Howard. New York: Hill and Wang, 1981. Print.
- Barzun, Jacques. *Science: The Glorious Entertainment*. New York: Harper and Row, 1964. Print.
- Bazin, André. "The Ontology of the Photographic Image." *What is Cinema?* vol. 1. Ed. and trans. Hugh Gray. Berkeley: U of California P, 2005. Print.
- Becker, George, ed. *Documents of Modern Literary Realism*. Princeton: Princeton UP, 1963. Print.
- Benedict, Ruth. *Patterns of Culture*. Boston: Houghton Mifflin, 1989. Print.

- Benjamin, Walter. *The Arcades Project*. Trans. Howard Eiland and Kevin McLaughlin. Cambridge, Mass.: Belknap-Harvard UP, 1999. Print.
- . "On the Concept of History." Trans. Harry Zohn. *Selected Writings*. Ed. Michael W. Jennings. Vol. 4. Cambridge, Mass.: Harvard UP, 2003. 389-400. Print. 4 vols.
- . "On Some Motifs in Baudelaire." *Illuminations*. Ed. and Introd. Hannah Arendt. Trans. Harry Zohn. New York: Schocken, 1968. Print.
- Berliner, Brett A. *Ambivalent Desire: The Exotic Black Other in Jazz-Age France*. Amherst: U of Massachusetts P, 2002. Print.
- Bernard, Claude. *Introduction à l'étude de la médecine expérimentale*. Paris: J. B. Baillière et fils, 1865. Print.
- Bernstein, Charles. "Poetics of the Americas." *Modernism/Modernity* 3.3 (1996): 1-23. *Project Muse*. Web. 10 January 2009.
- Rev. of *The Black Journey*. *American Journal of Sociology* 34.2 (Sept. 1928): 409. Print.
- Blackmur, R. P. "The Method of Marianne Moore." 1935; *Language as Gesture: Essays in Poetry*. New York: Harcourt, 1952. Print.
- Blum, Ann Shelby. *Picturing Nature: American Nineteenth-Century Zoological Illustration*. Princeton: Princeton University Press, 1993. Print.
- Boas, Franz. *A Franz Boas Reader: The Shaping of American Anthropology, 1883-1911*. Ed. George W. Stocking, Jr. 1974. Chicago: U of Chicago P, 1989. Print.
- . "Changes in Immigrant Body Form." *The Franz Boas Reader*. 202-14. Print.
- Bonner, S. F. Untitled. Rev. of *A Greek Critic: Demetrius on Style*, by Demetrius, ed. G. M. A. Grube. *Journal of Hellenistic Studies* 83 (1963): 171-2. *JSTOR*. Web. 13 July 2009.
- Borroff, Marie. *Language and the Poet: Verbal Artistry in Frost, Stevens and Moore*. Chicago: U of Chicago P, 1979. Print.
- Bremen, Brian A. *William Carlos Williams and the Diagnostics of Culture*. New York: Oxford UP, 1993. Print.
- Brewster, William. "Two Corrections." *The Auk* 10.4 (October 1893): 365. *JSTOR*. Web. 18 May 2009.
- Bridgman, Richard. *Gertrude Stein In Pieces*. New York: Oxford UP, 1970. Print.
- Brooks, Peter. "Storied Bodies, or Nana at Last Unveil'd." *Critical Inquiry* 16.1 (Autumn 1989): 1-32. *JSTOR*. Web. 1 June 2008.
- Brown, Bill.
- . *The Material Unconscious: American Amusement, Stephen Crane and the Economies of Play*. Chicago: U of Chicago P, 1996. Print.
- Brown, Frederick. *Zola: A Life*. New York: Farrar, Straus, and Giroux, 1995. Print.
- Buddemeier, Heinz. *Panorama, Diorama, Photographie: Entstehung und Wirkung neuer Medien im 19. Jahrhundert. Theorie und Geschichte der Literatur und der Schönen Künste*, vol. 7. Munich: Wilhelm Fink Verlag, 1970. Print.
- Bumpus, H[ermon] C[arey]. "A Contribution to the Discussion on Museum Cases." *Museums Journal* 6.9 (March 1907): 297-301. *University of California Southern Regional Library Facility*. PDF. 22 May 2009.
- Bumpus, Hermon Carey, Jr. *Hermon Carey Bumpus: Yankee Naturalist*. Minneapolis: U of

- Minnesota P, 1947. Print.
- Burke, Edmund. *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and the Beautiful*. Ed. J. T. Boulton. 1759; London: Routledge and Kegan Paul, 1958. Print.
- Buse, Peter, Ken Hirschkop, Scott McCracken, and Bertrand Taithe. *Benjamin's Arcades: An unGuided tour*. New York: Palgrave-Manchester UP, 2005. Print.
- Butler, Judith. *Gender Trouble: Feminism and the Subversion of Identity*. New York: Routledge, 1990. Print.
- Butterfield, W[illiam] R[uskin]. "Museums of Ideas." *Museums Journal* 11 (1912): 343-6. University of California Southern Regional Library Facility. PDF. 21 July 2009.
- Campbell-Kelly, Martin, and William Aspray. *Computer: A History of the Information Machine*. Boulder, Colo.: Westview, 2004. Print.
- Canguilhem, Georges. "Machine and Organism." *Incorporations* (Zone 6). Ed. Jonathan Crary and Sanford Kwinter. New York: Zone, 1992.
- Chapman, Frank M. "Ornithology at the World's Fair." *The Auk* 10.4 (October 1893): 315-21. JSTOR. Web. 18 May 2009.
- Charney, Leo, and Vanessa R. Schwartz, eds. *Cinema and the Invention of Modern Life*. Berkeley: U of California P, 1995. Print.
- Cheng, Anne Anlin. *The Melancholy of Race: Psychoanalysis, Assimilation, and Hidden Grief*. New York: Oxford UP, 2001. Print.
- Chodat, Robert. "Sense, Science, and the Interpretations of Gertrude Stein." *Modernism/Modernity* 12.4 (2005): 581-605. Project Muse. Web. 1 September 2008.
- Clark, T.J. *The Painting of Modern Life: Paris in the Art of Manet and his Followers*. Princeton: Princeton UP, 1984. Print.
- Clifford, James. *The Predicament of Culture: Twentieth-Century Ethnography, Literature, and Art*. Cambridge: Harvard UP, 1988. Print.
- Code, Lorraine. *What Can She Know?: Feminist Theory and the Construction of Knowledge*. Ithaca, NY: Cornell UP, 1991. Print.
- Cohen, Margaret. "Walter Benjamin's Phantasmagoria." *New German Critique* 48 (Autumn 1989) 87-107. Print.
- Cohen, Milton A. "Black Brutes and Mulatto Saints: The Racial Hierarchy of Stein's 'Melanchtha.'" *Black American Literature Forum* 18.3 (Autumn 1984): 119-21. JSTOR. Web. 3 November 2004.
- Copeland, Carolyn Faunce. *Language & Time & Gertrude Stein*. Iowa City: U of Iowa P, 1975. Print.
- Corbey, Raymond. "Ethnographic Showcases, 1870-1930." *Cultural Anthropology* 8.3 (1993): 338-69. Print.
- Costello, Bonnie. *Marianne Moore: Imaginary Possessions*. Cambridge, Mass.: Harvard UP, 1981. Print.
- . "Marianne Moore and the Sublime." *Marianne Moore*. Ed. Celeste Goodridge. Spec. issue of *Sagetrieb* 6.3 (Winter 1987): 5-13. Print.
- . " 'To a Snail': A Lesson in Compression." *Marianne Moore Newsletter* 3.2 (Fall 1979): 11-5. Print.

- Crane, Hart. *Complete Poems and Selected Letters*. Ed. Langdon Hammer. New York: Library of America, 2006. Print.
- Crary, Jonathan. *Suspensions of Perception: Attention, Spectacle, and Modern Culture*. Cambridge, Mass.: MIT P, 1999. Print.
- . *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*. Cambridge, Mass.: MIT Press, 1990. Print.
- Cushman, Stephen. *William Carlos Williams and the Meaning of Measure*. New Haven: Yale UP, 1985. Print.
- Daston, Lorraine. "Objectivity and the Escape from Perspective." *Social Studies of Science* 22 (1992): 597-618.
- . "Type Specimens and Scientific Memory." *Critical Inquiry* 31.1 (2004):153-82. Print.
- and Peter Galison. "The Image of Objectivity." *Seeing Science*. Spec. issue of *Representations* 40 (Autumn 1992) 81-128. Print.
- and Peter Galison. *Objectivity*. New York: Zone, 2007. Print.
- and Fernando Vidal. "Introduction: Doing What Comes Naturally." *The Moral Authority of Nature*. Chicago: U of Chicago P, 2004. 1-20. Print.
- Daum, Andreas W. "Varieties of Popular Science and the Transformations of Public Knowledge: Some Historical Reflections." *Isis* 100 (2009): 319-32. University of Chicago Press. Web. 7 July 2009.
- Davidson, Michael. *Ghostlier Demarcations: Modern Poetry and the Material Word*. Berkeley: U of California P, 1997. Print.
- DeKoven, Marianne. *A Different Language: Gertrude Stein's Experimental Writing*. Madison: U of Wisconsin P, 1983. Print.
- . *Rich and Strange: Gender, History, Modernism*. Princeton: Princeton UP, 1991. Print.
- Deledalle, Gérard. *Charles S. Peirce's Philosophy of Signs: Essays in Comparative Semiotics*. Bloomington: Indiana University Press, 2000. Print.
- "Delineament." *Oxford English Dictionary Online*. OED.com. Web. 22 April 2010.
- Derrida, Jacques. *Of Grammatology*. Trans. Gayatri Chakravorty Spivak. Baltimore: JHUP, 1976. Print.
- Doane, Janice L. *Silence and Narrative: The Early Novels of Gertrude Stein*. Westport, Conn.: Greenwood, 1986. Print.
- Du Bois, W.E.B. *The Souls of Black Folk*. Introd. Randall Kenan. New York: Penguin-Signet, 1995. Print.
- Duffey, Bernard. *A Poetry of Presence: The Writing of William Carlos Williams*. Madison: U of Wisconsin P, 1986. Print.
- Dummett, Michael. *Frege and Other Philosophers*. Oxford: Oxford UP-Clarendon, 1991. Print.
- . *Frege: Philosophy of Language*. 2nd ed. Cambridge, Mass.: Harvard UP, 1981. Print.
- Eliot, T. S. "Tradition and the Individual Talent. 1919. *The Norton Anthology of Theory and Criticism*. Ed. Vincent B. Leitch et al. New York: Norton, 2001. 1092-8. Print.
- . *The Waste Land and Other Poems*. Ed. Frank Kermode. New York: Penguin, 2003. Print.

- English, Daylanne K. "Gertrude Stein and the Politics of Literary-Medical Experimentation." *Literature and Medicine* 16.2 (1997): 188-209. Print.
- . *Unnatural Selections: Eugenics in American Modernism and the Harlem Renaissance*. Chapel Hill: U of North Carolina P, 2004. Print.
- "Extreme Mammals." *American Museum of Natural History*. American Museum of Natural History, n.d. Web. 18 May 2009.
<<http://www.amnh.org/exhibitions/extrememammals/>>.
- Farber, Paul Lawrence. "The Type-Concept in Zoology during the First Half of the Nineteenth Century." *Journal of the History of Biology* 9.1 (Spring 1976): 93-119. JSTOR. Web. 11 May 2009.
- Farland, Maria. "Gertrude Stein's Brain Work." *American Literature* 76.1 (March 2004): 118-148. *Duke Journals Online*. Web. 22 May 2009.
- Feldman, Evelyn, and Michael Barsanti. "Paying Attention: The Rosenbach Museum's Marianne Moore Archive and the New York Moderns." *Journal of Modern Literature* 22.1 (Autumn 1998): 7-30. Print.
- Felski, Rita. *The Gender of Modernity*. Cambridge, Mass.: Harvard UP, 1995. Print.
- Fleissner, Jennifer L. "Dictation Anxiety: The Stenographer's Stake in *Dracula*." *Nineteenth-Century Contexts* 22.3 (2000): 417-55. *Informaworld*. Web. 1 June 2009.
- . *Women, Compulsion, Modernity: The Moment of American Naturalism*. Chicago: U of Chicago P, 2004. Print.
- Les Français peints par eux-mêmes*. Vol. 1. Paris: Curmer, 1840. 9 vols. *Google Books*. Web. 19 June 2009.
- Freeman, Barbara Claire. *The Feminine Sublime: Gender and Excess in Women's Fiction*. Berkeley: U of California P, 1995. Print.
- Frege, Gottlob. *Begriffsschrift: A Formula Language, Modeled upon That of Arithmetic, for Pure Thought*. 1879. *From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931*. Ed. Jean van Heijenoort. Cambridge, Mass.: Harvard UP, 1967. Print.
- . "On Sense and Meaning." *Critical Theory since 1965*. Ed. Hazard Adams and Leroy Searle. Tallahassee: Florida State University Press, 1986. 623-36. Print.
- Friedberg, Anne. *Window Shopping: Cinema and the Postmodern*. Berkeley: U of California P, 1993. Print.
- Funkhouser, Linda, and Daniel C. O'Connell. "'Measure' in William Carlos Williams' Poetry: Evidence from his Readings." *Journal of Modern Literature* 12.1 (March 1985): 34-60. JSTOR. Web. 23 April 2010.
- Galison, Peter. *Image and Logic: A Material Culture of Microphysics*. Chicago: U of Chicago P, 1997. Print.
- Gates, Barbara T. *Kindred Nature: Victorian and Edwardian Women Embrace the Living World*. Chicago: U of Chicago P, 1998. Print.
- Geary, Christraud M., and Krzysztof Pluskota. *In and Out of Focus: Images from Central Africa, 1885-1960*. Smithsonian National Museum of American Art. London: Philip Wilson, 2002. Print.
- Gerber, Natalie. "Structural Surprise in the Triadic-Line Poems." *William Carlos Williams*

- Review 27.2 (Fall 2007): 179-86. *Project Muse*. Web. 25 April 2010.
- Gilman, Sander L. *Difference and Pathology: Stereotypes of Sexuality, Race, and Madness*. Ithaca, NY: Cornell UP, 1985. Print.
- Gilbert, Sandra M. "Marianne Moore as a Female Female Impersonator." In Parisi, ed. *Marianne Moore: The Art of a Modernist*.
- Ginsberg, Allen. *Journals: Early Fifties Early Sixties*. Ed. Gordon Ball. New York: Grove, 1977. Print.
- Gooding, David, Trevor J. Pinch, and Simon Schaffer, eds. *The Uses of Experiment: Studies in the Natural Sciences*. Cambridge: Cambridge UP, 1989. Print.
- Goodridge, Celeste. *Hints and Disguises: Marianne Moore and Her Contemporaries*. Iowa City: U of Iowa P, 1989. Print.
- Gravendyk, Hillary. "Experimental Embodiments: Poetry, Subjectivity, and the Phenomenology of the Body." Diss. U of California, Berkeley, 2009. Print.
- Gregory, Elizabeth, ed. *The Critical Response to Marianne Moore*. Critical Responses in Arts and Letters 39. Westport, Conn.: Praeger, 2003. Print.
- . *Quotation and Modern American Poetry: "Imaginary Gardens with Real Toads."* Houston: Rice UP, 1996. Print.
- Grier, David Alan. *When Computers Were Human*. Princeton: Princeton UP, 2005. Print.
- Guerlac, Suzanne. *The Impersonal Sublime: Hugo, Baudelaire, Lautréamont*. Stanford: Stanford University Press, 1990. Print.
- Gunning, Tom. "The Cinema of Attraction: Early Film, Its Spectator and the Avant-Garde." *Wide Angle* 8:3-4 (1986) 63-70. Print.
- Griffiths, Alison. "'Journeys for Those Who Can Not Travel': Promenade Cinema and the Museum Life Group." *Wide Angle* 18.3 (1996): 53-84. *Project Muse*. Web. 20 May 2009.
- . *Shivers Down Your Spine: Cinema, Museums, and the Immersive View*. New York: Columbia UP, 2008. Print.
- . *Wondrous Difference: Cinema, Anthropology, and Turn-of-the-Century Visual Culture*. New York: Columbia UP, 2002. Print.
- Grube, G[eorge] M[aximilian] A[nthony]. *The Greek and Roman Critics*. London: Methuen, 1965. Print.
- Gumbrecht, Hans Ulrich. *Production of Presence: What Meaning Cannot Convey*. Stanford: Stanford UP, 2004. Print.
- Haardt, Georges-Marie. "Thought the Deserts and Jungles of Africa by Motor." *National Geographic* 49.6 (June 1926): 651-720. Print.
- Hacking, Ian. *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*. Cambridge: Cambridge UP, 1983. Print.
- Haraway, Donna. *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™*. New York: Routledge, 1997. Print.
- . *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York: Routledge, 1989. Print.
- . *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge, 1991.

- Print.
- Harding, Sandra G. "Rethinking Standpoint Epistemology: What is 'Strong Objectivity'?" *Centennial Review* 36.3 (1992): 437-70. *University of California Northern Regional Library Facility*. PDF. 9 June 2009.
- Harrington, Anne. *Medicine, Mind, and the Double Brain: A Study in Nineteenth-Century Thought*. Princeton: Princeton UP, 1987. Print.
- Harvey, A. McGehee. "Creators of Clinical Medicine's Scientific Base: Franklin Paine Mall, Lewellys Franklin Barker, and Rufus Cole." *Johns Hopkins Medical Journal* 136.4 (April 1975): 168-77. *University of California Northern Regional Library Facility*. PDF. 9 June 2009.
- . "A New School of Anatomy: The Story of Franklin P. Mall, Florence R. Sabin, and John B. MacCallum." *Johns Hopkins Medical Journal* 136.2 (February 1975): 83-94. *University of California Northern Regional Library Facility*. 8 June 2009. PDF.
- Heuving, Jeanne. *Omissions Are Not Accidents: Gender in the Art of Marianne Moore*. Detroit: Wayne State UP, 1992. Print.
- Higonnet, Patrice. *Paris: Capital of the World*. Trans. Arthur Goldhammer. Cambridge, Mass.: Belknap-Harvard UP, 2002. Print.
- Hoffman, Michael J. *Gertrude Stein*. Boston: Twayne, 1976. Print.
- Horn, Nina, and Zeynep Tümer. "Menkes Disease and the Occipital Horn Syndrome." *Connective Tissue and its Heritable Disorders: Molecular, Genetic, and Medical Aspects*. 2nd ed. Ed. Peter M. Royce and Beat U. Steinmann. New York: Wiley, 2002. 651-85. *Google Books*. Web. 4 May 2009.
- Huyssen, Andreas. *After the Great Divide: Modernism, Mass Culture, Postmodernism*. Bloomington: Indiana UP, 1986. Print.
- International Code of Zoological Nomenclature*. *The International Code of Zoological Nomenclature Online*. International Commission on Zoological Nomenclature, 2009. Web. 18 May, 2009. < <http://www.iczn.org/> >.
- Jameson, Fredric. "Beyond the Cave: Demystifying the Ideology of Modernism." *The Ideologies of Theory: Essays, 1971-1986*. Vol. 2, Syntax of History (Minneapolis: U of Minnesota P, 1989) 115-32. Print.
- Jay, Martin. "Modernism and the Specter of Psychologism." *Modernism/Modernity* 3.2 (1996): 93-111. Print.
- Joyce, Elisabeth W. *Cultural Critique and Abstraction: Marianne Moore and the Avant-Garde*. Lewisburg, Penn.: Bucknell UP, 1998. Print.
- Kahan, Benjamin. "'The Viper's Traffic-Knot': Celibacy and Queerness in the 'Late' Marianne Moore." *GLQ* 14.4 (2008): 509-35. Print.
- Kant, Immanuel. *Critique of the Power of Judgment*. Ed. Paul Guyer, trans. Paul Guyer and Eric Matthews. Cambridge: Cambridge University Press, 2000. Print.
- Kass-Simons, G., et al., eds. *Women of Science: Righting the Record*. Bloomington: Indiana UP, 1990. Print.
- Keep, Christopher. "The Cultural Work of the Type-Writer Girl." *Victorian Studies* 40.3 (Spring 1997): 401-26. *JSTOR*. Web. 1 June 2009.

- Keller, Evelyn Fox. "Gender and Science." *Discovering Reality: Feminist Perspectives on Epistemology, Metaphysics, Methodology, and Philosophy of Science*. Ed. Sandra Harding and Merrill B. Hintikka. Boston: Kluwer-D. Reidel, 1983. Print.
- Kenner, Hugh. *A Homemade World: The American Modernist Writers*. New York: Knopf, 1975. Print.
- Kittler, Friedrich A. *Discourse Networks 1800/1900*. Trans. Michael Metteer and Chris Cullens. 1985; Stanford: Stanford UP, 1990. Print.
- . *Gramophone, Film, Typewriter*. Trans. Geoffrey Winthrop-Young and Michael Wutz. Stanford: Stanford UP, 1999. Print.
- Knower, Henry. "Editor's Preface." In Sabin.
- . "To Lewellys Barker." 7 April 1902. The Alan Mason Chesney Archives. The Johns Hopkins Medical Institutions, Baltimore. Rpt. in Schoenberg 254, 256.
- Koutstaal, Wilma. "Skirting the Abyss: A History of Experimental Explorations of Automatic Writing in Psychology." *Journal of the History of the Behavioral Sciences* 28 (1992) 5-27. Print.
- Kracauer, Siegfried. "The Mass Ornament." *The Mass Ornament: Weimar Essays*. Trans. and Ed. Thomas Y. Levin. Cambridge, Mass: Harvard UP, 1995. Print.
- Krauss, Rosalind E. *The Originality of the Avant-Garde and Other Modernist Myths*. Cambridge, Mass: MIT Press, 1986. Print.
- Ladino, Jennifer K. "Rewriting Nature Tourism in 'an Age of Violence': Tactical Collage in Marianne Moore's 'An Octopus.'" *Twentieth Century Literature* 51.3 (Fall 2005): 285-315. Print.
- Latour, Bruno. *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge, Mass.: Harvard UP, 1987. Print.
- and Steven Woolgar, *Laboratory Life: The Construction of Scientific Facts*. Princeton: Princeton UP, 1979. Print.
- Law, Joe. "La belle Hélène. Jacques Offenbach." *The Opera Quarterly* 18:4 (2002) 636-8. Print.
- Leach, William. *Lands of Desire: Merchants, Power, and the Rise of a New American Culture*. New York: Pantheon, 1993. Print.
- Levine, George, ed. *One Culture: Essays in Science and Literature*. Madison: U of Wisconsin P, 1987. Print.
- Lucas, Frederic A. *The Story of Museum Groups*. 4th ed. Guide Leaflet Series no. 53. New York: American Museum of Natural History, 1926. Print.
- Lunberry, Clark. "So Much Depends: Printed Matter, Dying Words, and the Entropic Poem." *Critical Inquiry* 30.3 (Spring 2004): 627-53. Print.
- Lutz, Catherine A., and Jane L. Collins. *Reading National Geographic*. Chicago: U of Chicago P, 1993. Print.
- Lye, Colleen. *America's Asia: Racial Form and American Literature, 1893-1945*. Princeton: Princeton UP, 2005. Print.
- Macbeth, Danielle. *Frege's Logic*. Cambridge, Mass.: Harvard UP, 2005. Print.
- MacDougall, David. "The Visual in Anthropology." *Rethinking Visual Anthropology*. Ed.

- Marcus Banks and Howard Morphy. New Haven: Yale UP, 1997. Print.
- MacInnis, Rob, et al. "A Mechanised Environment for Frege's *Begriffsschrift* Notation." *Proceedings of Third Mathematical Knowledge Management Conference*, 18-21 September 2004: *The Mathematical User-Interfaces Workshop*. Bialowska, Poland: University of Bialystok, 2004. Web. <http://www.activemath.org/~paul/MathUI04/proceedings/FregesBegriffsSchrift/FregesBegriffsSchrift_MathUI04.pdf>.
- Manganaro, Marc, ed. *Modernist Anthropology: From Fieldwork to Text*. Princeton: Princeton UP, 1990. Print.
- Martin, Wayne M. *Theories of Judgment: Psychology, Logic, Phenomenology*. Cambridge: Cambridge UP, 2006. Print.
- Massey, H. S. W. "Leslie John Comrie. 1893-1950." *Obituary Notices of Fellows of the Royal Society* 8.21 (November 1952): 96-107. JSTOR. Web. 4 June 2009.
- Mayr, Ernst. *The Growth of Biological Thought: Diversity, Evolution, and Inheritance*. Cambridge, Mass: Belknap-Harvard UP, 1982. Print.
- McCaffery, Steve. "The Death of the Subject: The Implications of Counter-Communication in Recent Language-Centered Writing." *Open Letter* 3.7 (Summer 1977): 61-77. Print.
- Meyer, Steven. *Irresistible Dictation: Gertrude Stein and the Correlations of Writing and Science*. Stanford: Stanford UP, 2001. Print.
- Michaels, Walter Benn. *Our America: Nativism, Modernism, and Pluralism*. Durham: Duke UP, 1995. Print.
- Miller, Angela L. "The Panorama, the Cinema and the Emergence of the Spectacular." *Wide Angle* 18.2 (1996): 34-69. Print.
- Miller, Cristanne. *Marianne Moore: Questions of Authority*. Cambridge, Mass.: Harvard UP, 1995. Print.
- Mitchell, W. J. T. *Picture Theory: Essays on Verbal and Visual Representation*. Chicago: U of Chicago P, 1994. Print.
- . *What Do Pictures Want?: The Lives and Loves of Images*. Chicago: U of Chicago P, 2005. Print.
- Mitterand, Henri. *Zola: L'histoire et la fiction*. Paris: Presses Universitaires de France, 1990. Print.
- Mohammed, K. Silem. "AWP 2010: Flarf & Conceptual Poetry Panel Intro." *Lime Tree*. Blogspot.com, 13 April 2010. Web. 14 April 2010. <<http://lime-tree.blogspot.com/2010/04/awp-2010-flarf-conceptual-poetry-panel.html>>.
- Molloy, Maureen. *On Creating a Usable Culture: Margaret Mead and the Emergence of American Cosmopolitanism*. Honolulu: University of Hawaii Press, 2008. Print.
- Moore, Marianne. *A Quiver with Significance: Marianne Moore, 1932-1936*. Ed. Heather Cass White. Victoria, B.C.: ELS Editions, 2008. Print.
- . *Becoming Marianne Moore: The Early Poems, 1907-1924*. Ed. Robin G. Schulze. Berkeley: U of California P, 2002. Print.
- . *The Complete Prose of Marianne Moore*. Ed. Patricia C. Willis. New York: Viking, 1986.

- Print.
- . "The Jerboa." *Hound and Horn* 6 (October-December 1932): 108-13. Print.
- . *The Poems of Marianne Moore*. Ed. Grace Schulman. New York: Viking, 2003. Print.
- . "The Sacred Wood" [Review of *The Sacred Wood*]. *The Dial* 70 (March 1921): 336-9. Rpt. in Moore, *The Complete Prose*. 52-5.
- Morgan, Lynn M. "The Embryography of Alice B. Toklas." *Comparative Studies in Society and History* 50.1 (2008): 304-25. *Cambridge Journals*. Web. 26 May 2009.
- . "Strange Anatomy: Gertrude Stein and the Avant-Garde Embryo." *Hypatia* 21.1 (Winter 2006): 15-34. *Project Muse*. Web. 26 May 2009.
- Morrisson, Mark S. *Modern Alchemy: Occultism and the Emergence of Atomic Theory*. New York: Oxford UP, 2007. Print.
- Morus, Iwan Rhys. "Currents from the Underworld: Electricity and the Technology of Display in Early Victorian England." *Isis* 84.1 (March 1993): 50-69. *JSTOR*. Web. 17 May 2010.
- Moynet, Jean-Pierre. *L'Envers du théâtre: Machines et décorations*. 2nd ed. Paris: Hachette, 1874. Print.
- Mulvey, Laura. *Visual and Other Pleasures*. Bloomington and Indianapolis: Indiana UP, 1989. Print.
- Nagel, Thomas. *The View from Nowhere*. Oxford: Oxford UP, 1986. Print.
- Nancy, Jean-Luc. *The Birth to Presence*. Trans. Brian Holmes et al. Stanford: Stanford UP, 1993. Print.
- . *The Ground of the Image*. Trans. Jeff Fort. New York: Fordham UP, 2005. Print.
- Nathanson, Tenney. *Whitman's Presence: Body, Voice, and Writing in Leaves of Grass*. New York: New York UP, 1992. Print.
- Ngai, Sianne. "Merely Interesting." *Critical Inquiry* 34.4 (Summer 2008): 777-817. Print.
- Norris, Frank. "Zola as a Romantic Writer." *Novels and Essays*. Ed. Donald Pizer. New York: Library of America, 1986. Print.
- North, Michael. *The Dialect of Modernism: Race, Language, and Twentieth-Century Literature*. New York: Oxford UP, 1994. Print.
- "Notes and News." *The Auk* 16.1 (January 1899): 94-6. *JSTOR*. Web. 18 May 2009.
- Oettermann, Stephan. *The Panorama: History of a Mass Medium*. New York: Zone, 1997. Print.
- Olson, Charles. "Projective Verse." *The New American Poetry, 1945-1960*. Ed. Donald Allen. 1960. Berkeley: U of California P, 1999. Print.
- Oreskes, Naomi. "Objectivity or Heroism? On the Invisibility of Women in Science." *Science in the Field*. Spec. issue of *Osiris*, 2nd ser. 11 (1996): 87-113. *JSTOR*. Web. 23 March 2009.
- Parisi, Joseph, ed. *Marianne Moore: The Art of a Modernist*. Ann Arbor: UMI, 1990. Print.
- Paul, Catherine E. *Poetry in the Museums of Modernism: Yeats, Pound, Moore, Stein*. Ann Arbor: U of Michigan P, 2002. Print.
- Peirce, C.S. *Peirce on Signs: Writings on Semiotic by Charles Sanders Peirce*. Ed. James Hoopes. Chapel Hill: U of North Carolina P, 1991. Print.

- Perelman, Bob. *The Trouble With Genius: Reading Pound, Joyce, Stein, and Zukofsky*. Berkeley: U of California P, 1994. Print.
- Peterson, Carla. "The Remaking of Americans: Gertrude Stein's 'Melanctha' and African-American Musical Traditions." *Criticism and the Color Line: Desegregating American Literary Studies*. Ed. Henry B. Wonham. New Brunswick, NJ: Rutgers UP, 1996. Print.
- Pickard, Zachariah. "William Carlos Williams, Description, and the Avant-Garde." *American Literary History* 22.1 (2010): 85-108. Print.
- Pickering, Andrew. *Constructing Quarks: A Sociological History of Particle Physics*. Chicago: U of Chicago P, 1984. Print.
- , ed. *Science as Practice and Culture*. Chicago: U of Chicago P, 1992. Print.
- Plato. *The Republic*. Trans. G. M. A. Grube and C. D. C. Reeve. *Complete Works*. Ed. John M. Cooper and D. S. Hutchinson. Indianapolis: Hackett, 1997. Print.
- Poe, Edgar Allan. "To Science." *American Poetry: The Nineteenth Century*. Vol. 1: Philip Freneau to Walt Whitman. Ed. John Hollander. New York: Library of America, 1993. 508. Print.
- Pound, Ezra. *A B C of Reading*. 1934; New York: New Directions, 1960. Print.
- . "How to Read." *Literary Essays of Ezra Pound*. Ed. T.S. Eliot. New York: New Directions, 1968. Print.
- "Precision." *The Oxford English Dictionary Online*. Web. 3 April 2009.
<<http://dictionary.oed.com>>.
- Rabaté, Jean-Michel, ed. *Writing the Image after Roland Barthes*. Philadelphia: U of Pennsylvania P, 1997. Print.
- Raine, Anne. "Science, Nature Work, and the Kinaesthetic Body in Cather and Stein." *American Literature* 80.4 (December 2008) 799-830. *Duke Journals Online*. Web. 28 May 2009.
- . "Still Life in the Age of Mechanical Reproduction: Nature, Modernity, and Marianne Moore." In Gregory, Elizabeth, ed. *The Critical Response to Marianne Moore*.
- Redouté, Pierre-Joseph. *Les Liliacées*. 8 vols. Paris: Didot jeune, 1802-16. Print.
- Reddy, Srikanth. "'To Explain Grace Requires a Curious Hand': Marianne Moore's Interdisciplinary Digressions." *American Literature* 77.3 (September 2005): 451-81. *Duke Journals*. Web. 18 May 2009.
- Retallack, Joan. *The Poethical Wager*. Berkeley: U of California P, 2003. Print.
- Ridgway, Robert. "Picicorvus an Untenable Genus." *The Auk* 11.2 (April 1894): 179. JSTOR. Web. 18 May 2009.
- Rieke, Alison. "'Plunder' or 'Accessibility to Experience': Consumer Culture and Marianne Moore's Modernist Self-Fashioning." *Journal of Modern Literature* 27.1-2 (Fall 2003) 149-70. *Project Muse*. Web. 18 May 2009.
- Rony, Fatimah Tobing. *The Third Eye: Race, Cinema, and Ethnographic Spectacle*. Durham: Duke UP, 1996. Print.
- Rossiter, Margaret. *Women Scientists in America: Struggles and Strategies to 1940*. Baltimore:

- JHUP, 1982. Print.
- Rothenberg, Tamar Y. *Presenting America's World: Strategies of Innocence in National Geographic Magazine, 1888-1945*. Hampshire, UK: Ashgate, 2007. Print.
- Rydell, Robert W. "World Fairs and Museums." *A Companion to Museum Studies*. Ed. Sharon Macdonald. Malden, Mass.: Blackwell, 2006. Print.
- Sabin, Florence R. *An Atlas of the Medulla and Midbrain*. Baltimore: Friedenwald, 1901. *Google Books-Lane Medical Library, Stanford*. Web. 7 June 2009.
- Saldivar-Hull, Sonia. "Wrestling Your Ally: Stein, Racism, and Feminist Critical Practice." *Women's Writing in Exile*. Eds. Mary Lynn Broe and Angela Ingram. Chapel Hill: U of North Carolina P, 1989. Print.
- Saussure, Ferdinand de. *Course in General Linguistics*. Ed. Charles Bally et al. Trans. Wade Baskin. New York: McGraw-Hill, 1959. Print.
- Schiebinger, Londa. *The Mind Has No Sex? Women in the Origins of Modern Science*. Cambridge, Mass.: Harvard UP, 1989. Print.
- Schildkrout, Enid. "Les Parisiens d'Afrique: Mangbetu Women as Works of Art." *Black Womanhood: Images, Icons, and Ideologies of the African Body*. Ed. Barbara Thompson. Seattle: U of Washington P, 2008. Print.
- Schoenberg, Bruce S. "Gertrude Stein's Neuroanatomical Investigations: Roses or Thorns?" *Southern Medical Review* 81.2 (1988): 250-8. *University of California, San Francisco Library*. Web. 1 June 2009.
- Schuchert, Charles. "What Is a Type in Natural History?" *Science* ns 5.121 (1897): 636-40. Print.
- Schulze, Robin G. "How Not to Edit: The Case of Marianne Moore." *Textual Cultures: Texts, Contexts, Interpretation* 2.1 (Spring 2007): 119-35. Print.
- . "Marianne Moore's 'Imperial Ox, Imperial Dish' and the Poetry of the Natural World." *Twentieth Century Literature* 44.1 (Spring 1998): 1-33. JSTOR. Web. 18 May 2009.
- Schuster, Joshua. "William Carlos Williams, *Spring and All*, and the Anthropological Imaginary." *Journal of Modern Literature* 30.3 (2007): 116-132. Print.
- Schwartz, Vanessa R. *Spectacular Realities: Early Mass Culture in Fin-de-Siècle Paris*. Berkeley: U of California P, 1993. Print.
- Scott, William Earl Dodge. *Bird Studies: An Account of the Land Birds of Eastern North America*. New York: G. P. Putnam, 1898. Print.
- "Scruple." Def. 1. *The Oxford English Dictionary Online*. Web. 3 April 2009 <<http://dictionary.oed.com>>.
- Secord, James A. "Extraordinary Experiment: Electricity and the Creation of Life in Victorian England." In Gooding et al.
- . "Quick and Magical Shaper of Science." *Science* 297.5587 (6 September 2002): 1648-9. *Science*. Web. 17 May 2010. <<http://www.sciencemag.org/cgi/content/full/sci;297/5587/1648>>.
- Seltzer, Mark. *Bodies and Machines*. New York: Routledge, 1992. Print.
- Serres, Michel. *Feux et Signaux de Brume: Zola*. Paris: Bernard Grasset, 1975. Print.
- Shapin, Steven. "The Invisible Technician." *American Scientist* 77 (1989): 554-63. Print.

- . *The Scientific Life: A Moral History of a Late Modern Vocation*. Chicago: U of Chicago P, 2008. Print.
- . *The Scientific Revolution*. 1996. Chicago: U of Chicago P, 1998. Print.
- . *A Social History of Truth: Civility and Science in Seventeenth-Century England*. Chicago: U of Chicago P, 1994. Print.
- , and Simon Schaffer. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton: Princeton UP, 1985. Print.
- Shepherd, Reginald. "Defining Post-Avant-Garde Poetry." *Reginald Shepherd's Blog*. Blogspot.com. Web. 17 May 2010. <<http://reginaldshepherd.blogspot.com/2008/02/defining-post-avant-garde-poetry.html>>.
- Short, T. L. *Peirce's Theory of Signs*. Cambridge: Cambridge University Press, 2007. Print.
- Shteir, Ann B. *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760-1860*. Baltimore: JHUP, 1996. Print.
- Slatin, John M. "'Advancing Backward in a Circle': Marianne Moore as (Natural) Historian." *Marianne Moore*. Spec. issue of *Twentieth Century Literature* 30.2-3 (Summer-Autumn 1984): 273-326. JSTOR. Web. 18 May 2009.
- . *The Savage's Romance: The Poetry of Marianne Moore*. University Park: Pennsylvania State UP, 1986. Print.
- . "'Something Inescapably Typical': Questions about Gender in the Late Work of William Carlos Williams and Marianne Moore." *Marianne Moore*. Ed. Theodora Rapp Graham. Spec. issue of *The William Carlos Williams Review* 14.1 (Spring 1988): 86-103. Print.
- Sluga, Hans. "Frege as a Rationalist." *Studien zu Frege / Studies on Frege*. Ed. Matthias Schirn. Stuttgart-Bad Cannstatt: Frommann-Holzboog, 1976. 3 vols. Print.
- Snow, C. P. *The Two Cultures and A Second Look*. Cambridge: Cambridge UP, 1980. Print.
- Solomons, Leon, and Gertrude Stein. "Normal Motor Automatism." *Psychological Review* 3 (1896) 492-512. Print.
- Spahr, Juliana. *Everybody's Autonomy: Connective Reading and Collective Identity*. Tuscaloosa: U of Alabama P, 2001. Print.
- Stein, Gertrude. *The Autobiography of Alice B. Toklas*. New York: Random House-Vintage, 1933. Print.
- . "Cultivated Motor Automatism; A Study of Character in its Relation to Attention." *Psychological Review* 5 (1898) 295-306. Print.
- . *Everybody's Autobiography*. New York: Vintage, 1973. Print.
- . *How Writing Is Written*. Ed. Robert Bartlett Haas. Los Angeles: Black Sparrow, 1974. Print.
- . *Paris France*. New York: Scribner's, 1940. Print.
- . "Portraits and Repetition." *Writings 1932-1946*.
- . *Tender Buttons: Objects, Food, Rooms*. In *Writings 1903-1932*.
- . "To Lewellys Barker." n.d. TS. The Alan Mason Chesney Archives. The Johns Hopkins Medical Institutions, Baltimore. Rpt. in facsimile in Schoenberg 255-6 and in

- Meyer 94-5.
- . *Writings 1903-1932*. Ed. Catharine R. Stimpson and Harriet Chessman. New York: Penguin-Library of America, 1998. Print.
- . *Writings 1932-1946*. Ed. Catharine R. Stimpson and Harriet Chessman. New York: Penguin-Library of America, 1998. Print.
- . "The Gradual Making of the Making of Americans." *Writings 1932-1946*.
- . "Melanchtha." 1909. *Three Lives*. *Writings 1903-1932*.
- . *Q.E.D.* 1950. *Writings 1903-1932*.
- Steinman, Lisa. *Made in America: Science, Technology, and American Modernist Poets*. New Haven: Yale UP, 1987. Print.
- Stevens, Wallace. "A Poet that Matters" [review of *Selected Poems*]. *Life and Letters To-Day* 13 (December 1935): 61-5. Rpt. in Gregory, ed. *The Critical Response to Marianne Moore*. 113-8.
- Stimpson, Catharine R. "The Mind, the Body, and Gertrude Stein." *Critical Inquiry* 3.3 (Spring 1977) 489-506. JSTOR. Web. 17 June 2009.
- Stocking, George W., Jr. *The Ethnographer's Magic and Other Essays in the History of Anthropology*. Madison: U of Wisconsin P, 1992. Print.
- Sutherland, Donald. *Gertrude Stein: A Biography of her Work*. New Haven: Yale UP, 1951. Print.
- Taylor, Henry Osborn. *The Mediæval Mind: A History of the Development of Thought and Emotion in the Middle Ages*. Vol. 2. London: Macmillan, 1911. 2 vols. Google Books. Web. 1 May 2009.
- Thurschwell, Pamela. "Supple Minds and Automatic Hands: Secretarial Agency in Early Twentieth-Century Literature." *Forum for Modern Language Studies* 37.2 (2001): 155-68. *Oxford Journals Online*. Web. 1 June 2009.
- Traweek, Sharon. *Beamtimes and Lifetimes: The World of High Energy Physics*. Cambridge: Harvard UP, 1988. Print.
- Veblen, Thorstein. "The Place of Science in Modern Civilisation." *The Place of Science in Modern Civilisation and Other Essays*. 1919; New York: Russell & Russell, 1961. Print.
- Vescia, Monique. *Depression Glass: Documentary Photography and the Medium of the Camera-Eye in Charles Reznikoff, George Oppen, and William Carlos Williams*. New York: Routledge, 2006. Print.
- Vilkko, Risto. "The Reception of Frege's *Begriffsschrift*." *Historia Mathematica* 25 (1988): 412-22. Elsevier Science Direct. Web. 11 June 2009.
- Wallis, Roy. "Science and Pseudo-Science." *Social Science Information* 24.3 (1985): 585-601. Sage. Web. 6 October 2009.
- Warner, Marina. *Phantasmagoria: Spirit Visions, Metaphors, and Media into the Twenty-first Century*. New York: Oxford UP, 2006. Print.
- Weatherhead, A. Kingsley. "William Carlos Williams: Prose, Form, and Measure." *ELH* 33.1 (March 1966): 118-31. JSTOR. Web. 23 April 2010.
- Weeden, Brenda. *The Education of the Eye: History of the Royal Polytechnic Institution, 1838-*

1881. London: University of Westminster, 2008. Print.
- Whewell, William. *The Philosophy of the Inductive Sciences, Founded upon their History*. London: J. W. Parker, 1847. Print.
- Whitman, Walt. "Crossing Brooklyn Ferry" [1891-2]. *Leaves of Grass*. Ed. John Hollander. New York: Vintage-Library of America, 1992. Print.
- Will, Barbara. *Gertrude Stein, Modernism, and the Problem of "Genius."* Edinburgh: Edinburgh UP, 2000. Print.
- Williams, William Carlos. *The Collected Earlier Poems of William Carlos Williams*. Norfolk, Conn.: New Directions, 1951. Print.
- . *The Embodiment of Knowledge*. Ed. Ron Loewinsohn. New York: New Directions, 1974. Print.
- . "Marianne Moore." Rpt. in Williams, *Imaginations*. Ed. Webster Schott. New York: New Directions, 1971. Print.
- . *Paterson*. Ed. Christopher MacGowan. New York: New Directions, 1992. Print.
- . *The Selected Letters of William Carlos Williams*. Ed. John C. Thirlwall. New York: McDowell, Obolensky, 1957. Print.
- Willis, Patricia C. "The Road to Paradise: First Notes on Marianne Moore's 'An Octopus.'" *Marianne Moore Issue*. Spec. issue of *Twentieth-Century Literature* 30:2-3 (Summer-Autumn 1984): 242-66. JSTOR. Web. 09 February 2009.
- Wineapple, Brenda. *Sister Brother: Gertrude and Leo Stein*. New York: G. P. Putnam, 1996. Print.
- Winsor, Mary P. "Non-essentialist Methods in Pre-Darwinian Taxonomy." *Biology and Philosophy* 18.3 (June 2003): 387-400. Springerlink. Web. 12 May 2009.
- "Women of Science: Gertrude Stein (1874-1946)." *Marine Biological Laboratory*. Marine Biological Laboratory, 2009. Web. 28 May 2009.
<http://www.mbl.edu/publications/women_stein.html>.
- Zola, Émile. *La Fabrique des Rougon-Macquart: Édition des dossiers préparatoires*. Vol. III. Ed. Colette Becker and Véronique Lavielle. Paris: Honoré Champion, 2006. Print.
- . *Le Roman Expérimental*. 3rd ed. Paris: G. Charpentier, 1880. Print.
- . *Nana*. Introd. Roger Ripoll. Paris: Garnier-Flammarion, 1968. Print.
- . *Nana*. Trans. and introd. Douglas Parmée. New York: Oxford World's Classics, 1992. Print.
- Zona, Kirstin Hotelling. *Marianne Moore, Elizabeth Bishop, and May Swenson: The Feminist Poetics of Self-Restraint*. Ann Arbor: U of Michigan P, 2002. Print.
- Zukofsky, Louis. "Sincerity and Objectification: With Special Reference to the Work of Charles Reznikoff." *Poetry* 37.5 (February 1931). Print.