



NEW SCIENCE, NEW WORLD

DENISE ALBANESE

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Dedicated to the memory of

Terry A. Comito and Anthony Albanese

for lines to live by:

“I once more smell the dew and rain” and

“There are three men in a rowboat

and the oars leak . . .”

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Acknowledgments

It occurs to me that writing acknowledgments is not really about putting paid to a debt. Signs of gratitude don't discharge obligations, but instead model them as dischargeable—which doesn't seem very likely to be true. Rather too like the act of writing the book to which they are prefixed, these acknowledgments make me hopelessly aware of how much will be left unsaid, how poorly the little that does get said represents the personal and intellectual terrain of obligation.

But here goes, anyway. A book as long in the making as this one has accrued a sedimentary history—which in turn means many successive layers of indebtedness to be worked through, brought to light, made evidentiary to a kind of historicist consciousness that is, I guess, not very far from the thematic interests of this book. Graduate school, for instance: although little of *New Science*, *New World* resembles the long-ago dissertation on Bacon he directed, John Bender has pride of place for his early enthusiasm about the possibility of conjoining my physics past with my literature-based present. I am also indebted to the friends from those days, Thomas Moser Jr., Deborah Laycock, and Deidre Lynch, and to the Whiting Foundation, for the award through Stanford University of a Whiting Dissertation fellowship in 1984–1985, which greatly aided my initial researches.

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Too many people close to me have died during the writing of this book. I will never be able to replace Gary Spear in my life, and there are not enough words to say why. The others—my father, Anthony Albanese, and my former teacher and colleague, Terry A. Comito—had the grace to see me through almost to the end of this project. *New Science, New World* is dedicated to these two men, who were so formative, so necessary, and so difficult, to live with and to lose. Hail and farewell.

PORTA tenet primas; habeas, GERMANE, secundas; / Sunt, GALILAE, tuus
tertia regna labor. / Sidera sed quantum Terris caelestia distant, / Ante alios
tantum Tu, GALILAE, nites. / Hi TELESCOPIO metantur paucula passum /
Millia telluris, vel vada salsa freti; / Quos infinitis, clarum dum scandis
Olympum / Arte parato OCULO, passibus ipse praecis. / Cedas, VESPUCI,
cedatque COLUMBUS; uterque / Ignotum saltem per mare tentat iter; / Nec
plane antipodum tellus tamen inscia priscis, / Nec quondam astronomos fugit
uterque polus: / Sed tu stellarum seriem, nova sydera caeli, / Humano generi
qui daret, unus eras.

—Poem to Galileo by Johannes Faber, prefixed to *Il Saggiatore*

Another error . . . is a distrust that any thing should now be found out, which the world should have missed and passed over so long time, as if the same objection were to be made to time that Lucian maketh to Jupiter and other the heathen gods, of which he wondereth that they begot so many children in old time and begot none in his time. . . . So it seemeth men doubt lest time is become past children and generation, wherein contrariwise we see commonly the levity and unconstancy of men's judgments, which, till a matter be done, wonder that it can be done, and as soon as it is done, wonder again that it was no sooner done. . . . And the same happened to Columbus in the western navigation. But in intellectual matters it is much more common. . . .

—Francis Bacon, *The Advancement of Learning*, Book I

And surely it would be disgraceful if, while the regions of the material globe—that is, of the earth, of the sea, and of the stars—have been in our times laid widely open and revealed, the intellectual globe should remain shut up within the narrow limits of old discoveries.

—Bacon, *The New Organon*, LXXXIV

any differential system is sustained by that which also fails to sustain it; were that not the case, there would be no history.

—Jonathan Goldberg, *Writing Matter*

Introduction

As the first three epigraphs to this Introduction suggest, the “New World” and the “New Science,” isomorphic for us through a trick of language that retrospectively endows each with an equal title to novelty, were also seen as homologous in the seventeenth century. What, however, can the homology be read to signify from this vantage? To claim both Europe’s geographical expansionism and the transformation of knowledge-seeking agendas as “modern” is a usual enough historical description. Still, it leaves unaddressed the near-circularity of the formulation and hence the genealogical relationship such “modern” forms have with the time and space of the writing that describes them.

New Science, New World reads the isomorphism of novelty as a *symptom* of modernity—as the sign of changes beneath the skin of early modern culture, changes that reveal how scientific modernity emerges from within the humanist textuality of the late Renaissance. Although it concerns some of the many explicit links made in seventeenth-century texts between the “New World” and the “New Science,” my book is not a study of how the connections are represented, how the organized investigation of nature is domesticated—propagated—through a rhetoric of common novelty. Nor is it a systematic account of such connections, although a very useful study remains to be written on just that subject. Rather, I propose to consider these colonialist tropes as the discursive signs of cultural change in suspension—what Raymond Williams has usefully called a structure of feeling.

To demonstrate how the literary becomes the exotic other of the scientific—in other words, to show how science and literature have come to occupy opposite poles in (post)modern culture—my book seeks out the connections between the New World and the New Sci-

ence as simultaneously emerging discursive patterns. While the repeated joining of the two topics in Renaissance texts makes clear that a rhetorical analogy exists between colonialism and science, the following analysis makes more of the conjuncture. Through examining utopian structures within texts canonical either in literature or science, I argue that such structures provide a way to read the onset of taxonomies of writing and, in turn, of a cultural division of labor, an inaugural scripting of an opposition between “fact” and “fiction” that follows along other oppositional constructions of culture still dominant in postmodern culture.

The present study takes its inspiration from Michel de Certeau’s assertion in *The Writing of History* that the modern world produces itself through othering, through discursive and material mechanisms that effectively bifurcate regions of culture, the better to legitimate some and delegitimize others.¹ The first, and in some ways the most significant, instance of this differentiation occurs when the present is separated from the past and what had heretofore been a lived archive becomes a repository of texts. But, as de Certeau argues, this rupture inaugurates something like a simultaneous chain reaction in which nature and “labor,” and then discourse and the body, begin to be deployed oppositionally. (It may be said in passing that this hypothesized moment of rupture constitutes the starting point for most of Foucault’s genealogical projects.)

In beginning with a shift in the discourse of temporality, *The Writing of History* makes the problematic of causation in historiography a discursive event in itself. It is humanist historiography that recognizes “change,” that makes time linear and progressive, that creates the “need” for cause-and-effect narratives—and not the other way round. For this reason alone, de Certeau’s text is invaluable for scholars who wish to question the necessarily reductive models of causation in historical narration, but who also find the successive descriptions of horizons limiting in the questions they make possible. But *The Writing of History* has the virtue of casting historical isomorphisms as the mechanisms of cultural change, in addition to their obvious role as the signs

of such change. Hence, the pertinence of the terms “New World” and the “New Science” in this study. I argue that, as a consequence of the culturally productive of mechanisms of opposition—particularly those mobilized by Renaissance colonialism—the emergence of modern scientific ideology in the seventeenth century resulted in the positing of fiction, of literary representation, as its binary (and prospectively devalued) opposite. One might consider fetishism as an intermediate term, in part because etymologically it straddles the epistemological gap between fiction and fact.² Although the networks connecting fetishism, fact, and fiction are not a direct part of the subject to hand, it is crucial to note that fetishism gains utility as a discursive counter at the emergence of colonialism. This, in turn, suggests the more general significance of the “New World” as a site of differentiation and distinction between “true” and “false”—or fictional. The legendary stories of dogheaded men, Amazons, and cannibals that attach themselves to the newly discovered territory are gradually replaced by accounts of New World inhabitants that, as I argue in chapter 1, are nascently akin to ethnography.

The dichotomy between fact and fiction, like all ideological handles, is of course subject to contestation, as too schematic and hence too neat. The cultural theorist Donna Haraway, for instance, begins her influential *Primate Visions* by questioning what she calls the “moral obligat[ion] to oppose fact and fiction.”³ Haraway, trained in biology as she is, embraces no reductive dismissal of scientific practice—indeed, as her work on “situated knowledges” suggests, she is interested in how to recover the study of nature from its institutionalized transgressions.⁴ Nevertheless, since scientific rationality has historically constituted a regime of truth that has subjugated other epistemological systems as its “others,” Haraway deems it crucial to call into question the current lines of opposition along which difference (and disciplines) are still constructed, and power deployed.

But what if we inverted the order of reasoning? What if, instead of problematizing the *present* discursive authority of science by showing how its facts are (among other things) productive and interested ar-

tifacts, we hypothesized the historical emergence of a difference between “fact” and “fiction”? What might the conditions be for such a differentiation to occur—not in any absolute sense, but in the local sense made available through a retrospective reading of some crucial seventeenth-century texts? To a great extent, raising such questions is the project of this book. The word “hypothesize” above is not casually chosen. As chapter 1 indicates, one sign of an emergent attempt to distinguish the scientific from the poetic, or fictional, is the controversy over the status of hypotheses as representations. Indeed, Fernand Hallyn has equated the early modern hypothesis with the practice of poetics.⁵ As just as Hallyn’s analyses are, their formalistic bent suppresses the prior question: why is it necessary to suggest that science has a “poetics” at all? Why, that is, work to establish not just a connection, but a near-identity between these discourses so clearly distinguished within the modern faculty of disciplines in terms of power, prestige, and epistemological authority?

Hallyn’s study, like mine, entails a form of redress. Like him, I invoke the possibility of a historical *a priori* different from the classical one out of which “science” proper formally emerges. But discerning the phantasms of preemergence, whether of science or of “literature,” is fraught with particular difficulties in the case of the early modern period, which the choice of the word “poetics” does not escape. For one thing, the earlier seventeenth century lacks the formal institutions that serve as material undergirding for the mature disciplines that go under the signs I have sometimes used. Hence the importance of figuration: tropes and discourses of novelty, particularly those associated with colonialism, stand in for those institutions. At the same time, they offer a way to make connections across disparate practices, and to take seriously the constitutive function of language.

A brief overview of this study makes clear just how far-flung those practices have become. Chapter 1, “Making It New: History and Novelty in Early Modern Culture,” constitutes a species of prolegomenon. It seems necessary to begin any discussion of the “New Science,” how-

ever revisionary, by an examination of the place of novelty in late Renaissance culture. The way into this discussion may seem unexpected, since it commences with some illustrations of "History" produced by the artist Cindy Sherman. These consist of uncanny attempts both to inhabit and reproduce "the past," even as they emblemize the impossibility of doing so seamlessly. This oblique discussion serves to introduce topics—gender, the body, novelty, and the past—that will continue to circulate throughout the book. To further understand the staging novelty in these discussions of new worlds and new sciences in early modernity, I then read Donne's *Ignatius His Conclave*. As a text uniting Columbus and Copernicus as damnable agents of the new, *Ignatius His Conclave* makes it possible to read rupture and innovation as functions of an emergent universalism of temporality, itself a function of modernity. In contrast to humanism's suppression of the gap separating its present from the classical antiquity which authorizes it (witness Petrarch's letters to classical authors), New World modernity provides an alternative way of talking about the past. I then move to a critical, exemplary analysis of the illustrations to Thomas Harriot's *Briefe and True Report of the New Found Land of Virginia*. Such (familiar) colonialist texts as Harriot's frame the radical difference between the inhabitants of Europe and the Americas as evidence of a universal narrative of development. If classical humanism posited the past as father to the present, the discovery of "primitive" cultures in the Americas suggests an alternative view—of the past as infantile, and of the present, consequently, as advanced. (That the past gestates, develops into the present, is not itself a universal model; rather, it competes with an elegiac representation of bygone wholeness or fecundity in late Renaissance texts.) In the framework provided by New World modernity, the bodies of natives, of others, become material evidence; this implicit dichotomy between corporeality and disincorporation maps onto the emergent scientific dichotomy between subject and object, which becomes paradoxically visible under the sign of femininity.

Chapter 2, "Admiring Miranda and Enslaving Nature," attends to the sign of that femininity, which is to say to the work that gender

does as a category of historical analysis (to borrow Joan Scott's useful phrase). I cast some of Donna Haraway's insights in *Primate Visions* about the ideological vectors of race and gender in modern science back into the late Renaissance to establish the pertinence of her analytical categories for early modern literary texts—themselves deemed "literary" by a back-formation that counterposes the producing of fiction with the inscribing of fact. The central text is *The Tempest*, which has been much read as a reworking of materials about colonialism by interpreters of the English Renaissance. I do not intend to contest that now-dominant reading so much as to supplement it with an older one: Prospero as magus/"New Scientist." It is no accident that Shakespeare's romance has lent itself to analyses of colonialist structure and scientific theme: New World and New Science are here contiguous, and the structures of domination and othering in the play-text place the work of the mind over against the work of the body, as Prospero is placed over Caliban. Just as excavations of the colonialism implicit in *The Tempest* operate to bracket Miranda as a character, so the triumphant suppression of the corporeal which the play makes possible has woman as ground, as pretext, as the state of nature upon which ideologies of modern science (and modern subjectivity) are constructed. The textual embodiment of the New World, in turn, is the discursive counterpart of that state of nature: the condition of possibility for the emergence of "science."

Utopian form as synecdoche for literary humanism, and as index for a moment of cultural instability, is further explored in chapter 3, "*The New Atlantis* and the Uses of Utopia." To read Bacon is to be poised on the threshold separating the literary canon from the scientific one: on one side, Milton and Shakespeare dwell, and the other is inhabited by Galileo. The liminality of Baconian texts is a clear trace of the cultural differentiation that the book is concerned to examine, and it is mapped out by *The New Atlantis*'s own relation to More's *Utopia*, its colonial pretext. Fiction is used to valorize fact, and the New World becomes a textual mechanism for the production of scientific subjects. Yet the incompleteness of Bacon's text is the triumph of the residuum,

of the unclear line demarcating Renaissance from modern, of the humanist text from scientific propaganda.

Chapter 4, "The Prosthetic Milton; Or, The Telescope and the Humanist Corpus," extends the previous argument about the encroachment of scientific modernity into literary space through a reading of *Paradise Lost*. A text embodying both the dominant forms of the Renaissance and the nascent structures of modernity, the epic's staging of human inquiry becomes symptomatic of an emergent ideology of knowledge. In constructing its own universal truths about Man [*sic*] and the cosmos out of the materials of theology and literary humanism, Milton's epic attempts to (re)establish the humanist text as an alternative to scientific models, and Eden as an America immune to the temporal narratives of modernity. But, as the central conversations between Raphael and Adam indicate (especially that on heliocentrism), the free play of knowledge is a sign of that modernity that cannot be excluded, and the American paradise an unstable utopia that cannot but slip over into history and contingency, and to the coming of another system of universals.

The final chapter, "Galileo, 'Literature,' and the Generation of Scientific Universals," opens up the issues I have considered within English print culture of the seventeenth century by returning to the Italian framework within which I commenced my examination of humanism. Here, I examine Galileo's exemplary construction of experimental spaces for an emergent scientific modernity. While the various documents Galileo sends out along with his scientific treatises invoke aesthetic criteria to justify—or protect—the performance of astronomy, in effect these citations of the literary also open up the possibility for reading a nascent, productive difference between one type of text and another. Given the ideological volatility of the Copernican hypothesis in the seventeenth century, Galileo's request for a literary response to, rather than a strict evaluation of, its truth-claims, cannot be seen as sign of an Edenic time before discursive differentiation, a time only of "writing." Instead, it signifies a betrayal that such differentiation has (always?) already occurred. Then I turn to Galileo's *Dialogue Concerning*

the Two Chief World Systems: the (textual) space of indifference that Bacon invents for inquiry, through his assimilation of narrative forms to empirical study, may be taken into the purview of the thought-experiment, which I read as a utopian text, a linguistic palimpsest of the New World, much as it is in Bacon. As with other representations of the New World I have considered, the thought-experiment models a space beyond constraint—beyond materiality and corporeality, indeed, in the freedom that it provides to examine interdicted ideas, a space beyond Catholic ideology: a claim itself constitutive of the ideology of modern science.

A few words about my method and critical practice seem in order. In a study dedicated, in part, to hypothesizing the emergences of the rationalistic and evidentiary structures generally associated with scientific modernity, I have often chosen, not systematic demonstration and analysis, but something more “literary.” This is, of course, not to enlist on the side of belles lettres, nor to suggest a bias against theory: my indebtedness to models of ideology critique, discourse analysis, historicisms “new” and after, to Haraway, Althusser, Foucault, de Certeau, and Serres is everywhere apparent. But I also wanted to practice a rather different type of historical modeling: as my epigraph from Jonathan Goldberg (himself inspired by Derrida) evinces, this modeling depends on a differential practice that does not reach its destination, or, rather, that survives in (post)modernity as an oblique form of critical practice. Perhaps the best methodological gloss on the pages that follow can be found in Foucault’s offhand speculations in *The Order of Things*:

In the modern age, literature is that which compensates for (and not that which confirms) the signifying function of language. Through literature, the being of language shines once more on the frontiers of Western culture—and at its center—for it is what has been most foreign to that culture since the sixteenth century; but it has also, since this same century, been at the very center of what Western culture has overlain. (44)

I say more in chapter 2 about Foucault's nostalgic positioning of literature as a conduit to authentic raw being; certainly despite himself Foucault also reveals the less innocent and more material role literature has played as a form of colonial indoctrination "on the frontiers of Western culture." The subjugating function of literature is very much to the point. But so, I might add, is its potential status as a subjugated discourse. Not, of course, that literature is not (still) mythologized as a site of "truth": but the utility of those quotation marks makes clear the nature of the problem. In invoking "literature" for my practice, I aim to valorize, not a model of transcendent universalism, but an almost Renaissance notion of a regime of truth with but an indirect relationship to the factual. The decision not to follow a systematic analytic also accounts for the uneven attention accorded to some strains of the argument, such as gender. While questions around embodied binaries are prominent in the chapters on Shakespeare, Milton, and historiography, they appear but intermittently in other sections. Since I am concerned to excavate a series of parallel oppositions whose formation (or re-formation) occurs more or less simultaneously, it makes sense that in certain texts certain aspects of that project might be foregrounded and others occluded.

I shall say more about my use of the word "literature" later. Before that, I want to address the status of Foucault in *New Science*, *New World*. To some, Foucault may seem an odd name to adduce to any account of sciences other than exclusively the human-centered. Such human sciences stand in a more-or-less mimetic relation to the authorizing mode of the natural sciences, with their "hard" data, mathematical methods, and valorization of empiricism. But these methods converge on an object of study that is self-evidently refractory, unlike the exteriorized nature recorded by apparatuses of investigation like the telescope. And even more: they are deployed around and oriented toward an object of study that was the concern of official interests and culture, so that the science of man could be read critically as at once establishing claims to power-knowledge and serving the interests of the state in the management of individuals or populations.

These quasigovernmental issues seem far away from the pure talk of the heavens or the subatomic, or (to pose the question of distance another way) the at-times inchoate systematizing of natural phenomena with which I am concerned. And yet it must surely be true that the production of "man" as object of knowledge is in dynamic, if subsequent, relationship to a "nature" similarly opened to scrutiny, brought into being as a discursive object, and rendered knowable in relation to the privileged subject-position from which the gaze, in the Foucauldian sense, emerges. In fact, the very secondariness of Foucault's institutions—medicine, psychology and psychiatry, and the like—reveals his assumptions about the legitimacy (in terms of power-knowledge) of the prior discourses of an objectified nature.

In an introduction to Georges Canguilhem's *The Normal and the Pathological*, Foucault has forged an explicit connection between the historical researches of French scholars like Canguilhem, and the Frankfurt School—whose well-known members, Max Horkheimer and Theodor Adorno, were also most famously critical of scientific modernity.⁶ Because it so clearly lays out the tradition from which Foucault's own work emerges, the introduction is worth quoting at length:

Works such as those of Koyré, Bachelard, or Canguilhem could indeed have had as their centers of reference precise, "regional," chronologically well-defined domains in the history of science but they have functioned as important centers of philosophical elaboration to the extent that, under different facets, they set into play this question of the Enlightenment which is essential to contemporary philosophy.

If we were to look outside of France for something corresponding . . . it is undoubtedly in the Frankfurt School that we would find it. . . . [I]n the end both pose the same kinds of questions, even if here they are haunted by the memory of Descartes, there by the ghost of Luther. These questionings are those which must be addressed to a rationality which makes universal claims while developing in contingency; which asserts its unity and yet proceeds only by means of partial modification when not by general recastings; which authenticates itself through its own sovereignty but which in its history is not

perhaps dissociated from inertias, weights which coerce it, subjugate it. In the history of science in France as in German critical theory, what we are to examine essentially is a reason whose autonomy of structures carries with itself the history of dogmatisms and despotisms—a reason which, consequently, has the effect of emancipation only on the condition that it succeeds in freeing itself of itself.⁷

Foucault's figuring of this kinship leads, finally, to a note on the terms I employ. While I have generally bypassed historiographic contestation over the extent to which it is possible to speak of a "Copernican revolution," I realize that I have stepped willingly into another quagmire in writing of "the Renaissance," "humanism," "modernity," and especially "literature" and "science." My debt to Foucault is everywhere apparent, and I did not lightly forgo the strenuously won insights his texts provide about the incommensurability of successive discursive regimes, nor the need to question traditional periodicity. Indeed, in working to establish a resemblance between two dominant discourses with equal title to novelty, I have had to bear in mind the importance of horizontal over vertical relationship, of filiations in space rather than over time. In *The Archaeology of Knowledge*, Foucault emphasizes that the classical discourse of "Natural History" differed, in procedures and in the organizational strategies around statements, from a "comparable" discourse of flora and fauna in the sixteenth century: so it may be said that the "natural philosophy" of the seventeenth century is far from identical with the culturally weighted discourse of modern institutional science.⁸

The differential specificity of a formation or an object of study is worth preserving. Yet it has seemed more urgent to supplement the archaeological Foucault with the genealogical one, and, indeed, to move toward the more overtly political critiques of modernity's dominant epistemologies afforded by Marxist models (which may have an explicit relation to Foucault), and feminist analyses (which often have had to contest the gender blindness of Foucault's schemata of power). Anachronistic terms have genuine strategic utility here, since they have the