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**RENOVATING BACONIANISM, READING BACON:
THE FATHERING OF SCIENCE**

By

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Submitted to the School of Graduate Studies

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RENOVATING BACONIANISM, READING BACON

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RENOVATING BACONIANISM, READING BACON: THE FATHERING OF SCIENCE

ABSTRACT

While Francis Bacon has come to be known as modernity's herald, the putative "father" of experimental scientific method, this commonplace notion has come to serve scholars, both within and beyond the confines of Bacon Studies, as a means by which to circumvent, rather than to scrutinize, his most important scientific texts. As a result, constructions of Bacon's thought today have come to diverge markedly from the texts that they claim to represent, often asserting on Bacon's behalf claims that Bacon himself would not only have rejected, but which at times he can be seen to directly refute.

The task of this thesis is threefold. Chapter One seeks to establish a strategy for reading Bacon's text that critiques the received wisdom concerning Bacon's utilitarianism and empiricism. This received wisdom is predicated on the failure to read--in perfectly literal terms--Bacon's text. In this regard, I elaborate a reading methodology in which Bacon's text is placed alongside Bacon Studies, creating a situation in which Bacon quite literally refutes the critical claims that have come to represent his thought in the twentieth century.

Chapter Two proceeds to offer a revised reading of Bacon's text itself. I dwell specifically on the theoretical nuances of the *Instauratio Magna*, elaborating on Bacon's articulation of scientific method that takes into account the theoretical presuppositions of his thinking. Eminently self-evident constituents of Bacon's philosophical itinerary--

induction, experiment, natural history, etc.--are cast in a new light when contextualized according to their place in Bacon's extended argument for a renovated natural philosophy.

Chapter Three suggests that, far from being the precursorial "father" of modernity, Bacon is still *fathering* it. Bacon's striking relation to the thought of Thomas Kuhn offers a new way to conceive of Bacon's continued impact on, and continued structuring of, the manner in which we produce scientific knowledge today.

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There are two teachers in particular from my undergraduate years whose impact on the course of my studies also deserves acknowledgment here. Andy Stubbs's sombre, thoughtful brilliance continues to remind me of the importance of considering the stakes of how and what we think. And in an academic age become increasingly cautious despite its putative radicality, Michael Moore's advice--to privilege the magnificent failure over

the mediocre success (hesitantly offered with all due irony to a naïve undergraduate student)--has become the default strategy for my own critical thinking.

I owe, finally, deep debts of gratitude to all the members of my family who have remained confident in my ability to undertake the task of the thesis, even and especially when doubts about it consumed me. To my mother, Roberta Desroches, and my father, Bernard Desroches, I owe the possibility of this thesis's existence, for it could not have been written without their support, their love, their strength, and their light. And to my wife, Heather Dorman, who had to bear the tidal brunt of this project's coming-into-being, I am indebted for reasons whose articulation here would only efface and insult her many sacrifices, sacrifices for which this thesis is but poor recompense.

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Polemical Introduction: On Bacon and Baconianism

This project is predicated on the belief that Bacon's text--the text of his scientific thought in particular--continues to name the fundamental procedures that guide the production of knowledge as we have come to know it. To make such a claim today is to resist generations of Bacon scholarship that have concluded Bacon to be a figure of a bygone epoch, a figment of modernity's imagination. This thesis articulates my resistance to that conclusion.

I say "resistance" rather than, for example, "disagreement," in order to indicate both what I believe, and also what I do not believe, to be the problem with Baconianism's understanding of Bacon today, and it is worth emphasizing that, in this regard, my concern in this thesis is every bit as much with the critical version of Bacon's text as with Bacon's text itself. That I believe Baconianism to name a different--intellectual, textual, philosophical--trajectory than that constitutive of the text it claims to represent, is perhaps the central motivation of this project. But at the same time, saying "no" to Baconianism--its judgments, opinions, but also its blindnesses--asks that we take Baconianism itself as the standard by which to judge our judgments of Bacon's text. There have been no shortage of apologists who claim Bacon to be the "father" of modernity, even as their counterparts cry out against Bacon's shortcomings. To reject or apologize for Bacon is to place faith in the Baconianism that this project examines at length and ultimately exposes for the critical delusion that it is, a delusion for which affirmation or negation could be nothing but beside the point if Bacon's text be considered.

And Baconianism is a delusion because, in the final instance, it no longer properly refers to the text for which it has spoken for so long. Whence arises the central question of this project: How may Bacon's text speak once more? The answer lies in resisting those pockets of critical interest that claim to be able to speak for Bacon, *either* for or against him.

It is a mark of the degree to which Baconianism has diverged from its namesake that we can suggest Bacon's text to be capable of responding in no uncertain terms to the critical judgments arrayed for and against it. In a theoretical age given to the pronounced critique of (among many other things) the putatively "outdated" notion of textual "origin," it is all the more telling that precisely this notion is indispensable to a reconsideration of Bacon's text. And it is indispensable because of the fundamental flaw that I see to characterize the study of Bacon today: the failure to read his texts. Though I spend some time articulating the methodological procedures that inform my attempt to read Bacon's text, what this failure to read represents is by no means an ephemerally conceived theoretical ploy for a new theory of reading as such. As the criticism of Bacon's texts demonstrate, there has developed within the confines of Baconianism a distaste for literally cracking open Bacon's text, a critical pathology characterized by a reluctance to read that, to my mind, jeopardizes not only the possibility of ever reading Bacon's text, but perhaps more fearfully, the very possibility of critical practice itself.

What follows are the three different, yet mutually dependent approaches that I have taken to cracking open the text, as well as the text of criticism itself; three strategies whose instincts are not simply to somehow recuperate Bacon's text, to render it readable,

legible, but also to ask after that form of intellectual labour undertaken in the name of criticism.

Chapter One

Renovating Baconianism

Part I.

1. Contexts

Francis Bacon, alluding to himself in the third person, offered this strangely proleptic assessment of both the stature and the stakes of his overhaul of natural philosophy, his

Instauratio Magna:

Certain it is that all other ambition whatsoever seemed poor in his eyes compared with the work which he had in hand, seeing that the matter at issue is either nothing or a thing so great that it may well be content with its own merit, without seeking other recompense. (NO, 4)¹

The importance of this passage might easily be overlooked as a kind of posturing (or counter-posturing) on Bacon's part--a means of positioning his thought that, after all, might not seem entirely unwarranted given the dominance in his day of the "Scholastic" epistemological programme over the production of knowledge, a programme whose tenets Bacon sought to resist, and in many cases refute. Yet when we look closely at the Baconianism that Bacon's thought has inspired,² this particular passage acquires another kind of importance. For it has come to both order and prescribe the interpretive possibilities of Bacon's text, and in this, demands serious attention as to how so innocuous (precisely, perhaps, because so grandiose) a statement concerning the merit of the project that Bacon augurs has come to have such far-reaching and profound effects.

When we say that this statement has ordered and prescribed the interpretive possibilities of the text, we refer specifically to how Baconianism--Bacon as he is construed by his most recent commentators--has come to view the meaning and historical range of Bacon's project in general. To a great degree, in this regard, critical commentary concerning Bacon's natural philosophy has been implacably drawn to one of two conclusions: Bacon's project is either nothing or it is a thing great. The nothing/great dichotomy we propose here is constituted by a series of constative declarations--judgments--that concern the efficacy of Bacon's thought for (the history of) the scientific endeavour. As Antonio Perez-Ramos, one of Bacon's best commentators, has recently noticed, those declarations, often diametrically opposed, have had a long and steady history of their own:

Concordet wrote in 1793 that Bacon had discovered 'la véritable méthode pour étudier la Nature'; in 1810 Goethe doubted that one could even speak of a Baconian 'method'; in the early Victorian period William Whewell hailed the Lord Chancellor as 'the supreme Legislator of the Modern Republic of Science,' whereas, at the end of the century, Thomas Huxley stigmatized the claims of Baconian philosophy as 'pseudoscientific cant.' (*Disputations*, 577)

The superlatives here clearly evince a certain recourse to Bacon's original self-characterization, whether knowingly or not, and still haunt to a large extent the ways in which it is possible to speak not only of Bacon's thought, but also of the Baconianism that seeks to articulate it. Bacon is "viewed either as a fraud or as the fountain-head of modern scientific rationality"(577), and just as the vigorous debate between these poles continues to stimulate the bulk of critical work on Bacon today, so has it increasingly become the case in the critical literature that there is little else to discuss when it comes to

Bacon's oeuvre. It is worth pausing for a moment on some of the judgments made for and against Bacon's project, though I should make one peculiar point clear: depending on the nature of one's own affinities for and with Bacon's programme, conceptions of Bacon's project as "nothing" or "great" can be entirely interchangeable. I make this point in order to explain how critics aligned against Bacon's thought can still make points that, in different and closely related contexts, might be construed as a mark of Bacon's greatness. (Jardine's comments below, for example, are particularly double-edged.) A small cross-section of "judgments" then:

- **Great**

Lisa Jardine:

By reconstructing the intellectual backcloth against which Bacon posed the particular methodological questions which engaged his attention I believe we are led to appreciate the originality and ingenuity of his own solutions, and are restrained from reading back into his work a concern with issues which have subsequently been judged crucial for the development of scientific and philosophical method. (2-3)

Peter Urbach:

My view, however, is that Bacon's contribution to the understanding of scientific method is greatly undervalued. . . and that, properly understood, it is interesting, largely original and, as far as it goes, substantially correct. (24)

- **Nothing**

James Stephens:

Francis Bacon. . . has earned a reputation as a father of modern science without having contributed anything solid to the growth of experimental knowledge. (215)

Lynn Thorndike 1964:

In conclusion there is not much more that one can say for Francis Bacon. He was a crooked chancellor in a moral sense and a crooked naturalist in an intellectual and scientific sense. He did not think straight. (35)

It is worth noting that even Bacon's defenders, like the two above, remain in some sense cowed by the rejection of Bacon's thought that has dominated twentieth-century characterizations; Jardine's defense of Bacon's "ingenuity" and "originality" is tempered by her insistence that Bacon's thought has little bearing on our own; Urbach's apology is completely overdetermined by the grounds upon which Bacon has been (usually mistakenly) rejected. Little comment is needed (though much is necessary) concerning the deprecating characterizations of Stephens and Thorndike, for in the latter comments, the necessity to read Bacon's text is entirely suppressed by the lordly suggestions that Bacon offers little of importance to read, or is not worth reading at all.

The recourse to a discourse of originality, overt or implied in the comments above, draws our attention to another problem in the understanding of Bacon's text. Such critical submission to "Bacon's dichotomy" has most recently been justified by deferral to a certain historical conclusion concerning the plausibility of thinking Bacon's relation to our own day. Whether the result or the cause of the numerous constructions of Bacon's thought, it has become the case that discussing Bacon means introducing a certain rhetoric of patrilineal indebtedness--Bacon as "father"--leading to the conclusion, even if implicitly as in Urbach's comments above, that Bacon's thought belongs to a time and a place--the Renaissance--that we, as contemporaries, can claim to have surpassed. That sentiment is articulated in a host of ways, and it is worth offering here a few of its manifestations, from the ridiculous to the sincere:

Lynn Thorndike:

It was a relatively easy thing to criticize the past and present state of learning, and to advocate a new programme, including 'experimental science.' [!!!] Roger Bacon had done it three and a half centuries before. But when it came to getting down off one's high horse of generalities and putting one's shoulder to the problem of particular phenomena of nature and dealing with specific facts and beliefs and traditions and errors, Francis Bacon was as helpless as Pliny had been in antiquity or as anyone else was in the early seventeenth century. The best that one can say for him is that he really tried. (35)

Michael Hattaway:

Bacon was essentially a conservative thinker and those passages in his writing where he seems to be forward looking, even modern in his notions of scientific method, are in fact informed by metaphysical paradigms. Like most medieval and Renaissance thinkers Bacon worked largely by correspondences and analogies, and he is definitely a natural philosopher in that his theoretical system is anterior of his works. (184)

Charles Whitney:

Indeed, the primarily allegorical poetry of Bacon's day provides an encouraging context for and may have helped to mold the distinctive features of Bacon's scientific method and goals--Bacon's own disclaimers notwithstanding. ("Contexts," 69)

The above comments make it clear that the verdict concerning Bacon's (lack of) modernity has been so deeply internalized that to speak today of his work in any context outside of his contribution to *Renaissance* thought, to the *history* of ideas, is to commit nothing less than an error in method. Thorndike's comments could be "unpacked" (with much relish) for a long time: it is enough to say that there are few critics today who would agree with this "high-horse" theory, since even a reductive understanding of Bacon's induction (which itself will be the subject of some scrutiny later in this project) notes that Bacon's obsession was precisely with particulars. We only wish that Thorndike

had tried half as hard to understand Bacon as Bacon did to understand the world. If Hattaway believes that the natural philosopher of the Renaissance is defined by the fact that one's assumptions must precede one's practice, then we are all Renaissance women and men, and natural philosophers as well. We shall discover, in fact, that Bacon is largely responsible for making it a criterion of scientific investigation that a theory must be in place to sanction any kind of inquiry whatsoever--all the more reason to consider the close confluence of Bacon's thought with our own. Whitney may be right about the influence of poetry on Bacon's thought, but why that disqualifies Bacon from surpassing it in important theoretical ways is a mystery.

While these variations, on both sides, are themselves capable of offering some illuminating insights, the conclusions they generate, by their very nature, cannot surpass Bacon's dichotomy upon which they are founded. Given that such prescription determines, in many ways, our reception of Bacon's program, it is with good reason that Laurence Lampert has concluded that Bacon himself is largely responsible for that reception: "Bacon's reputation has fallen victim to his own success; Baconian science, forward-looking, ever-advancing, world-mastering science, seems to outstrip the need for mere philosophy" (17-18, 1993). If certain characterizations are in need of revision here, especially the rhetorics of victimization and mastery which we will eventually show to be quite misplaced, there is, nevertheless, no question that Bacon himself somehow determined (though I doubt in any knowingly systematic way) the limit and scope of potential responses to his project some 400 years ago, and with the merest of rhetorical

turns. We have not, that is to say, been able to read beyond the first four pages of Bacon's most important work.

In recent years, this double (re)construction of Bacon's thought--nothing or great--has undergone an important critical sublation. The result has been a stark avoidance of the stakes of Bacon's project, an evasion that has come to manifest itself in Bacon studies as nothing short of a critical neurosis that tries to characterize Bacon's so-called achievements as *both* nothing and great; in so doing, it has become difficult to speak coherently about Bacon at all. Take for example Michel Malherbe's recent comments on the "importance" of Bacon's thought:

It is a historical fact that Bacon's philosophy is contemporaneous with the birth of modern thought. But it is also a fact that modern thought has developed in a way which does not accord with the idea that Bacon gave of the new science. . . We [...] can say, as the French Encyclopedists did, that he was the herald of experimental philosophy. But the fact remains that the Baconian concept of science, as inductive science, has nothing to do with and even contradicts today's form of science. (75)

Can Bacon's thought be both nothing and great, especially given what we can assume to be the staid conception of history offered here? What is meant, more importantly, by the phrase "inductive science," a phrase that Bacon would not only have never used, but also would probably have attributed to the very dialectici whom he was at pains to critique? We often forget that Bacon spoke and theorized about both a "good" and "bad" form of induction--i.e. his own and Aristotle's. Is it clear here, given a certain terminological promiscuity, which Malherbe means? J. E. Tiles has suggested, in reference to Baconian and Aristotelian conceptions of experiment, that today's understanding of the experiment seems not to have surpassed, in its essentials, an Aristotelianism (463-65); whether we

agree or not, how, and on what grounds, do we account for the potential validity of such a comparison? Might we not also question what the difference might be between a “Baconian” concept of experiment, and “Bacon’s” understanding of it? And just what, exactly, was the “idea” that Bacon gave of the “new science?” For if, on the other hand, Bacon is heralded as the progenitor of modern “experimental philosophy,” as many critics (like, among others, Peter Urbach³) suggest, and if, according to Tiles and Malherbe, we largely obey, in the exact sciences especially, certain commandments issuing from that philosophy, then why the reticence to make the connection to Bacon? Why, in the end, do we conceive of Bacon’s contribution to (the philosophy of) science, or the history of ideas, as *both* something and nothing? For the nothing/great dichotomy comes to imply a “relevant/non-relevant” dichotomy as well (a dichotomy that we shall eventually demonstrate to be irrelevant), and what Malherbe has done here is to displace the stakes of Bacon’s thought according to a received wisdom--today’s Baconianism--that is itself, in the very first instance, determined according to the nothing/great binarism offered by Bacon.

Already, however, our questioning of Malherbe begs of the very critical tradition that, we announce, must be critiqued. It is precisely this interminable loop of returning to Bacon in order to determine--to *judge*--his project that must somehow be circumvented, or at least realized as a methodological peculiarity, if we are going to understand the confluence of his thought with that of our own day. For there is not simply a connection; that would be to imply that Bacon’s thought, the conceptual and theoretical articulations it makes, stands only in some kind of continuous or contiguous relation to the ways that

we generate knowledge today, and would thus return yet again to the nothing/great historical overdetermination. I want to claim here that Bacon is our contemporary, and that we have yet to see our way past his thought--*all Baconianisms aside*; have yet, that is, to be able to see *anything but* Bacon's project, despite what now seems to be the critical emphasis on over-looking it.

It will take the rest of this project to determine why and how this is the case, not the least of which related tasks will be to get some hold of what it means to call a philosophical position "Baconian." But it should be made clear from the outset that such claims are not made in the spirit of a recuperation or apologia, a well-intentioned approach to Bacon's thought that still hounds him (and which can only, in the best of cases, return it to the nothing/great problematic). Rather, the intention here is to return a text, so long neglected despite the many reams of critical attention it has inspired, to the very field of questionability and interpretability. To do this, of course, necessitates that we first demonstrate that Bacon's text has been *outside of this field*, and has remained outside it almost since its very emergence because of the strange resistance to *reading* that has marred its critical reception. At stake is not simply Bacon's text understood as it attaches to the proper name, but Bacon's text as it obtains across that name's critical history as well. That is to say, a re-evaluation of Bacon's thought can no longer take place without an equally rigorous examination of the literature that has constructed his thought in various but ultimately, if not obviously, coeval ways. This means that we need to re-conceive the monikers that have, for too long, figured our understanding of Bacon's thought: if Bacon is the "father" of modern science, or experimental method, or industrial

science, the utilitarian *par excellence*, it is nevertheless true, in the reading we shall offer here, that such constructions of Bacon's oeuvre do more to occult the tenets of his scientific thought than to reveal them.

It may, at first glance, no longer seem possible to separate Bacon from Baconianism. Indeed, to claim that these two words, born of the same collection of philosophical texts, mark entirely different trajectories of thought concerning the scientific endeavour as we have come to know it,⁴ could be considered scandalous, if it were not for the fact that the question of Bacon's (and Baconianism's) relation to contemporary thinking, and the value of bothering to distinguish between this name and this "legacy," has been, for most scholars of either Bacon's work or of the history of ideas in general, less important than either denigrating his project or trying to rescue it. Such attempts are telling as to the degree to which critical thought has resisted understanding, through at times very troubling "misreadings" (or in the case of the likes of Thorndike [and indeed, there are more like him] "anti-readings"), the implications that Bacon's project holds for a concerted questioning of the scientific enterprise that today we hold so dear, and again, it is worth reiterating that even those well-intentioned attempts to rescue Bacon's project from the vagaries of posterity are themselves partly responsible for subjecting Bacon's thought to it. For such readings and characterizations are, above all, symptoms of a way of thinking about Bacon's texts that see these texts as best understood in genealogical relation to the way that science is thought and practiced today. Some of the better commentators who see themselves as attempting to resist the mere questioning concerning the ancestry of our own thought, seem nevertheless forced

to reproduce the very assumptions they challenge--if, for example, Perez-Ramos implies that looking in Bacon's text for prophetic instances of modern science is only useful for polemic, and fails to meet the demands of "rigorous scholarship" (*Disputations*, 578), it is the very question of what "rigorous scholarship" means that challenges such a position, i.e., becomes itself polemical. Perez-Ramos's project, indeed, is one concerned to discover *Bacon's* ancestors (and that some of them are Bacon's contemporaries does not contradict this search in the slightest). Thus for him, rigorous scholarship not only demands that we cease making the attempt to relate Bacon's thought to our own in an explicit way; we must, above all, "read [Bacon] from his contemporaneous context if we are really attempting to reconstruct past canons of thought, i.e. past meanings" (587-588). The question, I say, that we must ask ourselves is this: Is Bacon's project a "past" canon of thought?

We cannot, I think, take this received wisdom for granted, particularly if it is the case that Bacon's thought remains a fundamental theoretical constituent of the contemporary scientific enterprise. Gerald Gillespie offers a rather telling description of what is truly at stake in leaving Bacon, or any thinker, "behind" in this way:

Yet since "reformation" and "renaissance" were long ago elevated as guiding concepts of Anglo-American culture, the process of change may well have required eventually that we forget we are repeating a pattern in order to forestall a genuine rebellion against the sustaining "myth" of transformation itself. (119)

One crack in this "sustaining myth" can be seen to have emerged with Timothy J. Reiss's suggestion that "Bacon's is not. . .an idea of science limited to a relatively brief moment at the beginning of the seventeenth century. It remains our own. It remains indeed by and

large the underlying premise behind all our discourses of truth and, therefore, behind all the forms of what we term ‘knowledge’” (226-7). What Reiss says here--one of a very few to make so bold a claim--is, to my mind, an important insight: Bacon’s thought, whatever else we might think it to be, *is our own*. To do justice to this claim, and to understand the grounds upon which it can be construed as a valid one, it is necessary that we turn to the question of the difference between what it means to interpret Bacon’s work--i.e., in the sense in which we see Baconianism interpreting it always and everywhere according to Bacon’s dichotomy--and what it means to *read* it, for only in the determination of a new way to approach Bacon’s text shall we be able not only to return it to a field of questionability and interpretability--i.e., as a *text*, and not a reductively construed philosophical position--but ultimately to elucidate precisely what it is about Bacon’s text that makes it one in need of being construed as eminently contemporary. To do this, we need to determine precisely what is meant by the terms “interpretation” and “reading,” not only in order to orient for ourselves a new and more illuminating path into Bacon’s text, but also in order to demonstrate the problems and blindnesses of prior interpretive and critical work concerning that text. This will occasion here a brief detour through the work of two scholars, Andrzej Warminski and Stanley Fish, whose preoccupation with the question of reading and interpretation will help us to “triangulate,”⁵ as it were, a reading strategy capable of accounting not only for that which has remained unaccounted for in Bacon’s text, but also for the attendant blindnesses and insights to which Bacon’s thought has been submitted by Baconianism and so-called Baconians. That is to say, we mean here to try to read both Bacon’s text, and the

Baconianism that remains irreducible to it; it is, indeed, the question of that irreducibility that is at stake.⁶

2. Of Reading and Interpretation.

If Fish's work will later help us to determine *how* to read Bacon's text, and the mechanics of that engagement, Warminski's dense theorization of the very distinction between reading and interpretation will help us to demonstrate that we *must read* Bacon's text in the first instance. In other words, where Fish offers us insight into the tactics necessary for a re-reading of Bacon's oeuvre, Warminski's thinking will, in a similar way, help us to develop a reading strategy. That said, it will still be impossible for us to ascribe in total to the reading theory that Warminski espouses; the reason for this will have to do with a rather complicated critical problematic that arises with regard to the Baconian oeuvre, and the different goals that our project here sets for itself. All this will be elucidated as we unpack Warminski's theory of reading in the "Introduction" to his important text, *Readings in Interpretation*.

We must, in the first instance, understand a fundamental difference between the function of Warminski's discussion of interpretation and reading, and the discussion that we shall eventually develop for ourselves. Part of this difference in function rests largely on the formal features of what is being read or interpreted: Warminski is "reading" poetry--Hölderlin--alongside what he construes to be the two most philosophically rigorous interpretations of that poetry to date: the interpretations of Hegel and Heidegger. Warminski speaks in highly reflexive terms about his own text in his "Prefatory Postscript" (from which we are basing our remarks here) and its relationship, as a text, to

the poetic text of Hölderlin, which is in turn cast in a dynamic relationship with Hegelian and Heideggerian readings, all of which, in textual terms, become capable of reading one another. This kind of interimplication is most properly the symptom of a *book about reading*.⁷ We, on the other hand, are reading--attempting to read/interpret--a text whose orientation might be considered a bit different: Bacon's thought can be called a philosophical corpus (though many of his commentators find this distasteful) or even a scientific corpus (with, again, a similar distaste); either way, our orientation here, slightly different than Warminski's, concerns the question of why we should, and how we should, undertake to read/interpret the work of Francis Bacon. While the question of a certain (self)reflexivity in Bacon's text will be the object of a considerable amount of scrutiny, the question of my particular text's interimplication with Bacon's will only ever remain a matter of implication, for certain necessary reasons that have to do with the critical problematic mentioned above--i.e., the formal mode of both our enquiry and our object text. Nevertheless, certain elements of Warminski's discussion can quite profitably be transcribed into the context of the discussion of reading Bacon's thought, and these have precisely to do with what it means to read, thoughtfully and with patience, any text.

Whether one "reads" or "interprets" depends largely on how one conceives of the text *qua* text in philosophical terms, and it is Warminski's important insight to demonstrate the degree to which the very conception of a readable text rests on certain philosophical decisions. To read, for example, at least in Warminski's sense, is to be able to grasp the self-reflexive, and self-interpreting, features of a text's linguistic, over against the phenomenological reduction of "a" text to "the" book. (xxviii-xxix). As

rarefied a point as this can seem, we may easily see it made with some force by the example of Bacon's work, and especially in relation to the commentary with which we began our discussion. For Bacon studies has made of Bacon's text--indeed, Bacon himself--a "thing" of history and philosophy. Bacon, as we have already noted, is "fetishized" as the "father" of modern science (or modern method, or experimental science, etc.), and even "anti-fetishized" (itself a form of fetishization) by the likes of Thorndike. In becoming the historical object that it has in an unaccounted for reduction to Bacon himself, Bacon's thought exhibits precisely the phenomenological reduction of which Warminski speaks. Thus, we come to interpret Bacon's thought according to the rubrics and monikers associated with his name, even as it becomes less and less likely that, in doing so, we will be able to read the texts he wrote. And if Bacon's name becomes itself a kind of historico-philosophical phenomenon, many of his most important concepts are subjected to a similar kind of reduction. The notion of induction, for example--reductively understood to be the logical movement from the particular to the general, and always and everywhere attributed in some degree to Bacon--turns into a hypostatized methodological constant that, while seeming to have come to define the very essence of the Baconian ethos, in truth misplaces the emphasis that Bacon gives to the concept (as we shall discover in due course). It is, then, in this distinction between self-reflection (reflexivity) linguistically conceived within the text, and the phenomenological reduction of the text itself, that Baconianism, insofar as it "reduces" Bacon's text, can no longer be said to properly refer to its namesake.

But more needs to be said about this difference, as constituted by Warminski, between the “linguistic” and the “phenomenological,” for insofar as they mark the difference between reading and interpretation, they produce certain complementary binarisms: reading/interpretation = linguistic/phenomenological = poetics/hermeneutics = syntax/semantics, etc. At least, they appear to be binarisms. As Warminski argues, however, these philosophic pairings are anything but symmetrical inversions of each other, and in fact could be construed as *asymmetrical* relationships, since either term at once implies and conceals the operations and effects of its counter-part. In order to understand what reading is, then, it is necessary to question concerning reading according to a logic that, even if counter-intuitive, suggests that to know what reading is cannot be determined by interrogating reading itself--we must interrogate its “asymmetrical opposite,” interpretation.⁸ While Warminski himself notes that the articulation of the distinction between interpretation and reading--of central importance in the determination of what we read and interpret--“is difficult to do [. . .] apart from the specific reading of a specific text” (xxx), it is precisely because of this recognition of specificity that the “three easy steps” that Warminski recommends to be taken in the formulation of the reading/interpreting problematic are of invaluable assistance to us, not only in helping us to determine what reading is in general, but also in allowing us room to determine the kinds of questions at stake in the reading of Bacon in particular.⁹

Step One

In order to interpret, it is necessary (1) to understand the opacity in the text’s (and the interpreter’s) self-reflection in terms of a rigorous conception of the negative. . . (xxxi).

What Warminski takes for granted as a constituent of interpretation needs careful elucidation when it comes to the question of Baconianism, for the very concept of a “textual opacity” (let alone its capacity for self-reflection) in Bacon’s oeuvre seems never to have been considered. Bacon’s text is not opaque, but perfectly transparent, at least to those who consider his text in the kind of phenomenological terms outlined above.

Already, then, there is a certain sense in which we can say that Bacon’s text remains not only unread, but also uninterpreted. The “rigorous conception of the negative” by which we come to understand this “opacity” refers simply to a fundamental constituent of any dialectical form of questioning--in Warminski’s terms, “a negative that can account for the difference between apparent and nonapparent meaning. . .” (xxxix). Without this model--and indeed, *any* (dialectical) model--of the negative, writes Warminski of his own book, “we have little chance of making any sense of the hyper-reflexive texts of Hölderlin, Hegel, and Heidegger” (xxxii). We would be quite wrong to think that Warminski’s dense theorization of textual opacity, the “hyper-reflexivity” endemic to the text, and the “philosophical negative” that is necessary to figure and unpack it, lies beyond the purview of anything that either Bacon thought, or Baconians might need to worry about. To be sure, it would be a gross misprision to attempt to apply “Hegelian” or “Heideggerian” conceptions of the negative--what Warminski recalls as “determinate negation” and “Nothing” respectively--to Bacon’s text.¹⁰ Yet there is already a model of the negative--a dialectic--at work there, one that signals precisely a sort of “hyper-reflexivity”: we saw it in the nothing/great dichotomy that Bacon himself inaugurated, and that Baconians have come to deploy as a governing interpretive model with little or

no understanding of its function--indeed, with little or no knowledge of its prior existence in Bacon's work itself. While Baconian commentary, as we have demonstrated above, bases its understanding on the nothing/great dichotomy, it does so in a manner that fails to recognize the *appurtenance* of that distinction: it does not belong to a logic of (e)valuation pure and simple, though this might seem its most obvious relevance. In fact, for us, it offers more insight to see the nothing/great dichotomy as the first of numerous self-interpretations that take place throughout Bacon's text, and especially in the *Novum Organum*. Not only does a form of self-reflection emerge as concerns the project itself (i.e., nothing/great), but a certain self-reflection concerning the self-interpreter, Bacon himself (i.e., self-deprecating/self-aggrandizing). Nor is any of this gratuitous, but rather serves as a manoeuver calculated to both multiply and at the same time account for the philosophical implications of the project itself--its "apparent" and "nonapparent" meanings, as Warminski put it above. This should come as no surprise to even the most staid Baconian scholarship, which has always maintained, if nothing else, that Bacon was a master rhetorician.

Bacon's text too, then, has its own conception of the negative--i.e. the opposite of great, the absolute lack of merit--that helps to constitute, not simply a valuation of the project, but rather the kind of self-reflection that, as we shall demonstrate in due course, not only governs and possesses Bacon's thinking, but opens up the possibility for the kind of reading and interpretation that we are slowly unpacking here. In having formulated it above as the nothing/great dichotomy, we may proceed to step # 2.

Step Two

In order to begin reading, it is necessary (2) to reformulate, rewrite, this negative in the text's relation to itself (and the interpreter's to himself or herself) in linguistic terms. . . Since the "philosophical" conception of the negative was itself the suppression or covering over of what we are calling the "linguistic negative" [. . .] to reformulate the "philosophical negative" in linguistic terms amounts to a certain restitution of its textual "origins": that is, what the (philosophical) text had to forget in order to constitute, remember, itself, in order to get itself written. (xxxii)

What is necessary to our renovation of Baconianism (which is not to be confused with a renovation of Bacon's text) is precisely the exigency to retain, and maintain, the conception of a "textual origin," even despite the epistemological pitfall that this kind of thinking can represent, as recent theoretical trends have pointed out (not to mention the problems that arise with the question of originality that we gestured to above). Indeed, the retention of the notion of textual origins, despite its sympathetic resonance (but not identity) with the very phenomenological reductions that we critiqued above, is quite indispensable in the elucidation of what it will mean to read/interpret Bacon's work. As Warminski points out, it is precisely the recourse to the rewriting of the philosophical negative in terms of a linguistic that sanctions this move. It may help to understand this shift from step one to step two by using a rather literal (if too quickly elaborated) conception of how we see the question of Baconianism interimplicated in all this. This is precisely the moment at which we depart from a disciplined adherence to Warminski's elaboration--but after all, it is now to the specificity of our own theoretical situation that we now turn.

We might, to begin, associate the "philosophical negative"--that which suppresses, occults, conceals meaning in the text--with the commentary and criticism concerning Bacon's text, on the grounds precisely of the sort of assumptions concerning

Bacon's thought that have come to prevalence with its phenomenological reduction. We notice here that, where Warminski's circle of texts remains largely those of traditionally conceived "primary" texts, we introduce into our elaboration the question of the importance of the traditionally conceived "secondary text."¹¹ Thus, the "linguistic negative" to this philosophical negative would be Bacon's text, the "textual origin" of its own misreading, which is to say that *Baconianism itself* becomes the "asymmetrical opposite" to Bacon's text. To read/interpret, anew, Bacon's text, should be considered the response to a field of commentary and criticism that no longer conceives Bacon's thought in terms of a text at all, but rather as a corpus of hypostatized ideas--induction, experiment, etc.--that lead in turn to the hypostatization of Bacon *the man* as a figure of (and indeed, for) the history of ideas in general (i.e. as the "father of modern science"). Our attempt to read/interpret simply reminds us that *there is a text to be read* when it comes to the question of Bacon's thought. Hence emerges the emphasis here on the "linguistic," i.e., the recourse to *language*, over against the philosophical, i.e., in this case, the recourse to a certain phenomenology of the book (I shall more concretely exemplify this in due course.) In a quite literal sense, it is as if what we propose here means to remember (and not just re-member) Bacon's text, for there can be no question that most of the received judgments concerning Bacon's thought have allowed us to entirely forget it.¹²

The (Im)possible Third Step

We have seen in the first two of Warminski's "three easy steps," (obviously not quite so easy as he makes out), an effort made to move from the field of interpretation

which, despite any desire to move past it, is always necessary, to the field of reading, in which we restore to the text its linguistic provenance. Interpretation has come to represent the philosophical decisions and reifications we make concerning the texts we read; reading, the elucidation of the linguistic features of the text that get covered over by such philosophical decisions. In terms of our reading of Bacon, we have tried to exemplify the movement from step one to step two--the movement from the philosophical negative to the linguistic negative--in terms of the distinction that can be made between Baconianism as a field of study constituted, at least today, by certain reified philosophical decisions concerning Bacon's text, and Bacon's text itself, whose linguistic features it will be the task of this project to restore to the light of day, even as this task, by necessity, marks a profound disjunction, an asymmetry, between it and the Baconianism that claims to know it. These two steps have, so far, been quite helpful in determining for us the stakes of a new approach to Bacon's text, insofar as we have been guided toward a language-oriented form of inquiry, and around the kinds of phenomenological reductions of text-to-book that have characterized Bacon studies to date. We begin to see the possibility for a reading of Bacon's text that would significantly alter our received understandings of such Baconian concepts as "induction" or "experiment," if for no other reason than the fact that such a strategy returns us to a text that remains largely ignored.

There is, however, a problem. According to the first two steps, it would seem that reading would be that which restores "textual origins"--the linguistic negative--to their proper place of priority over the phenomenologically reduced interpretive sense of the text. But as Warminski points out, this is precisely what it *must not be*: to understand

reading in this way is in fact to return the gains we have made over the philosophical, by means of the linguistic, right back to the field of interpretation, the field where meaning, and even nonmeaning, can still be attributed to sense, the very ground of our philosophical decisions and phenomenological reductions. The problem here lies in conceiving of language itself--the linguistic, the tropic, the rhetorical, the inscribed--precisely in terms of the very philosophical negative that we have been critiquing.¹³ That is to say, it is possible to replace the philosophical with the linguistic, but if the linguistic itself is still philosophically conceived--i.e. according to the practiced dialectical manoeuvres of philosophy that are fully capable of recovering the contradictory, the *negative*, for the purposes of sense--then we still have not made the leap from interpretation to reading. As Warminski writes:

This confusion--of interpretation with reading, ultimately--is possible only as long as we understand trope and inscription, rhetoric and writing, *language*, in a traditional (i.e., philosophical) sense: all trope in terms of (symmetrical) transfers of sense between literal and figurative; all writing in terms of a (symmetrical) opposition to speech. All philosophical thought--Hegel's and Heidegger's *par excellence*--has no trouble whatsoever dealing with and disposing of such trope and inscription. (xxxii)

Accordingly, then, our "third easy step" would simply be to apply a certain rigour to our conception of language, to think language in linguistic, rather than philosophical, terms. The very possibility of doing so, however, raises a thorny issue that returns us to the very roots of the first step, or more appropriately, to that which must necessarily precede any "first" step. For our first step of interpretation, to have "taken" its first steps as a "philosophical" text, to have been an "interpretation" at all, must somehow have displaced, covered over, concealed, a linguistic that was *already present* (or, as

Warminski prefers to figure it, already *not* present). Thus, to replace this displacing philosophical interpretation would not in any simple sense mark the restoration of textual origins, but would rather be a *re-writing*, differing, by a logic of iterability and *asymmetry*, from any ordinary linguistic. To understand this is to realize that this so-called third step has inhered in the work of reading and interpretation all along, and by doing so, has nullified the possibility of conceiving any process like the one we have described in terms of “steps” at all:

If the philosophical interpretation (and all interpretations are philosophical) constitutes itself by a leap--of misreading or *not* reading--then to repeat that (same and other) leap, backward as it were, is not to deconstitute it (or to reconstitute its origins) but to tell still another story, (re)write still an other (and the same) supplementary text: an allegory of reading. . . (xxxiv).

It is here that we leave off our discussion of Warminski, and remind ourselves again of the different trajectory, and different stakes, of our project. It is in the elaboration of this “third step” that his book truly becomes “a reading of reading,” or an “allegory” of reading (and as he also says, of unreadability.) Ours, however, is meant more properly as a book of elucidations, of a kind of reading/interpretation (exemplified by “step two”) rather than a “pure” (i.e. allegorical) reading, of Bacon’s project, and the Baconianism that claims to figure it. If it is true that every book that claims to read must also, in some sense, be about reading too, it will nevertheless be the case here that, for essential reasons, the volatility of this kind of reflexivity will have to be thrust aside for the time being.

It is in choosing this particular moment to diverge from Warminski’s path of reading, precisely in order, I suppose, to take a road more traveled by, that the “essential

reasons” for that divergence (which I have already alluded to a number of times) can be cast in stark relief. As we intimated at the beginning of our discussion of Warminski, it would appear that not only has Bacon’s text not been read (in either a philosophical or linguistic sense), but it appears not to have been interpreted with the degree of perspicacity that we might wish. If all interpretations are philosophical, it is nevertheless clear that some are better than others, and one of the peculiarities of Warminski’s theory of reading--his reading of reading--is that it entirely depends on this (as we have seen in his “choice” of Hegel and Heideggerian readings of Hölderlin, the “philosophically most rigorous.”) There is, however, a compelling reason for this stipulation, and Warminski himself articulates it:

The only thing more foolish than thinking that one can be “against” interpretation, meaning, philosophical systems, and all the (Greek) gifts that, say, phallogocentric humanism brings with it is to think that one can do anything to resist it by invoking the immediacy of the “concrete,” “history,” “politics,” and the like without, before, interpreting its texts, never mind reading them (xxxv).

Without, before, interpreting its texts, never mind reading them. We take this necessity for interpretation as the guiding instinct of this interrogation of Bacon and Baconianism--Bacon’s text is in need of a thoughtful and patient interpretation, even before we can begin to read it. Thus, we will not claim to “read” Bacon’s text, or Baconianism, in any allegorical sense, but we will maintain that, given the current state of thinking concerning Bacon’s work, this would be impossible anyhow. In other words, to try to read Bacon now would simply occasion the reading of Baconianism, and would do little to elucidate Bacon’s text. For what we have seen, whether we agree with Warminski’s paradigm or not, is the clear reduction--concretization perhaps--of Bacon’s text, and that precisely in

terms of the historiographical construction of Bacon's importance to the history of ideas. It has been a decided *lack* of interpretation that has allowed us to reject, ignore, or simply fail to recognize, the importance of Bacon's text to contemporaneity. In pitting Bacon's text "against" (but not symmetrically so) the Baconianism that so far has ordered and determined its historico-philosophical range and importance, we shall discover not only that Baconianism fails to "account" for Bacon's text, but also that, in this failure, it becomes inevitable that there is no way to account for Baconianism itself, leaving us with the startling realization that there is no text, anywhere, to account for. I do not mean this as the sort of disembodied rhetorical flourish that often characterizes this kind of theorizing. There are a number of points in the commentary where we can see Bacon's text literally disappearing, where it becomes the object of received speculation concerning its contents, rather than the target of more thoughtful and patient reading (and interpreting). We shall soon encounter such texts, which range from critics in the field of Bacon studies to profoundly influential philosophers of science of the twentieth century. (And indeed, we have already caught a brief glimpse of them above in the likes of Thorndike, Stephens, and Malherbe).

In this perplexing confluence of critical and philosophical misprision and misrepresentation lies the necessity for us to return Bacon's text to a "field of readability," a phrase I use to mark not only the text's legibility, but just as importantly the very the domain of the text that exists beside its philosophical hypostatization. In making this move, Baconianism itself must inevitably be read by our reading—I imply the sort of reading exhibited in the second step of Warminski's itinerary, a sort of hybrid

between reading and interpretation that, if bound in the end to a philosophical dialectic, nevertheless makes language the new target of its study of Bacon, and the lack of attention to language the new target of its study of Baconianism.

Landing Place: From Misreading to Missed Readings

A reading/interpreting, a perpetual second step, that must always come, necessarily, just prior to our recognition of the impossibility of stepping through the text in this way, is now what is necessary if we are to understand why Bacon's thought is so crucial to us today, and if we are to make it susceptible of decisive inquiry--of Warminski's third step--once more. Certain questions, however, will arise at this point, specifically concerning our attempt to swerve away from Warminski's reading of reading. Why, for example, use Warminski's model at all if we mean in the end to ignore what is perhaps its most important--third--step, the very step that makes of these three steps one large step in itself? How do we justify what is surely an entirely arbitrary decision to emphasize the second step, and to de-emphasize the third? What, ultimately, is the *use* of Warminski's model in the reading of Bacon's text?

Our discussion earlier of some of the critical vagaries to which Bacon's text has been subjected by Baconianism offers the vital clue in the answer to these questions, and it is a more detailed discussion of Baconianism--not, perhaps surprisingly, Bacon's text itself--that helps us to formulate a response to them. We recall, first of all, that Warminski's second step suggests for us, *above all*, that there is a text to be read, and to understand our move away from Warminski while simultaneously pointing out its indispensibility to our project is not difficult if we recall our opening suggestion that

Bacon's text has not only not been read, but also that it has not even been interpreted. We are not talking about a question of misreading or misinterpreting--as we pointed out, this alone would not sanction the kind of return to "textual origins" that we are calling for here. At stake for us is the sheer prominence of *mistaken* interpretations, marshaled in order to bolster the claims of a Baconianism that, circularly, relies on these received interpretations for its continued prominence. Our claim to return to the text, then, may sound something like a return to New Criticism, and perhaps it is--but the object text is no longer *simply* Bacon's, but the critical apparatus that has made Bacon's text eminently interpretable, and almost entirely unreadable. Our emphasis on Warminski's second step seeks to make the crucial point that we are no longer, at the moment, in a position to read Bacon's text. It is perhaps one of the singular peculiarities of Baconianism that this precise lack of reading--at the very level of actually opening the book and reading the words--has haunted it for at least the last fifty years. Fulton H. Anderson said in 1949 that "[m]any [have] assessed his opinions without reading what he has had to say" (292). L. Jonathan Cohen has said that "[d]uring the past hundred years Bacon's writings have been seriously misinterpreted with surprising frequency" (219). Geoffrey Hartman has said, in a more general context, that "It is an illusion of the rising generation that the canonical works of the past have been read too often, and are securely enshrined as official touchstones. The best criticism since 1930 reveals how little they were read; they served other ends than being transmitted in their full complexity" (8). And in a more localized and specific context, Brian Vickers, perhaps Bacon's most important commentator on the question of prose style, said in 1971 of a particular critic's treatment

of Bacon's use of theatre imagery that he "has not read very carefully. He does not notice many references to theatre, he gives a brief and unfavourable account of Bacon's theory of imagination, he misquotes, and interprets to fit a pre-determined thesis" (190).

Twenty-one years later, in 1992, Vickers' lamentation on the reading habits of Bacon's critics still continues, but now it has taken on an entirely new importance:

Yet the study of recent literature shows that the growth of knowledge [in Bacon studies] is neither automatic nor steady. There are, to begin with, backslidings, in which insights established by earlier studies are either not known or ignored. So we are still told that Bacon hated the imagination, distrusted drama, or fiction, or poetry. I fondly imagined that I had sufficiently refuted L.C. Knights uncritical use of T. S. Eliot's notorious (and largely discredited) theory to make Bacon personally responsible for creating the "Seventeenth Century Dissociation of Sensibility," that denial of the free functioning of the imagination from which apparently also derived the evils of soil erosion, the internal combustion engine, and America. I thought that R. M. Adolph and myself, publishing independently of each other, had laid to rest the theories of English Renaissance prose style invented by Morris Croll and George Williamson, according to which Bacon wrote a "Senecan" or "Anti-Ciceronian" style; but that Hydra has developed more heads since then. If these attacks on old misconceptions have not succeeded, then they must be restated more forcefully, with further evidence. (498-499).¹⁴

If Vickers' lament seems more like a rebuke for a critical audience that is not reading *him* (but indeed, perhaps it should), his point is nevertheless germane; critics are not only not reading Bacon, but they are also not reading each other--a double failure, a double "pathology." We should not underestimate the necessity for making these kinds of observations about Bacon's critical literature, for the persistence of a deliberate ignorance of the contents of Bacon's text remains most troubling. Note, for example, Anthony Quinton's description of the "problems" with Bacon's *Essays*:

It is not just their somewhat artificial air of being exemplary exercises that makes Bacon's *Essays* less attractive than other, more earnest-seeming

works that he wrote in English. Their aphoristic style of construction, a string of epigrammatic felicities printed as continuous prose, is tiresome. The impersonality which is brought into vivid relief by the comparison with Montaigne is, we feel, inappropriate to the form: impersonality is for the treatise or paper; the essay proper should be more confessional and intimate. Douglas Bush memorably said of Bacon's *Essays*, 'everyone has read them, but no one is ever found reading them.' (75)

Inconceivably, the resistance to reading Bacon, seen in Quinton's odd "review" of the *Essays*, is justified not by some sort of recourse to the text, but by recourse to a critic whose distaste for reading takes on the features of a kind of "memorable" truism--Quinton remembers Bush precisely in order to forget about Bacon. In this dark vortex of critical solipsism, it cannot go without saying that the moment at which such criticism consciously refuses to read the text--to open its very pages--all criticism is lost.

And yet I do not think it is enough to simply "restate more forcefully, with further evidence" one's position, particularly if one is not being read, or simply ignored, in the first place. We discover here not just a resistance to reading, but a *reluctance to read*. Warminski's model is so valuable to us because the second step of his tri-partite structure of reading helps us to locate precisely where that reluctance lies. In recognizing the manner in which the philosophical negative of a text suppresses its linguistic features, its very language, we are able to locate not only the beginnings of a dangerous interpretive move that shifts us away from Bacon's text and towards its reduction to the book, (or even "the man"), but we simultaneously find a way to reintroduce the necessity for reading without simply relying on force, Vickers's strategy. Warminski's second step allows Bacon's text, the "textual origin" itself, *to read our readings*--Bacon's text literally comes back to haunt Baconianism. The restitution of the textual origin of

Bacon's thought, an origin occulted by nothing more or less than our reluctance to read it, comes to present itself alongside our critical musings in order to confirm or dismiss our critical claims. (It does not speak well of four hundred years of Baconianism that Bacon's own text must do our critical work for us.)¹⁵

This alternative approach to Bacon's text produces some rather remarkable results, the most startling of which for the philosophy of science--the discovery that Kuhn's *The Structure of Scientific Revolutions* is a literal re-writing of Bacon's *Advancement of Learning*--will be elaborated upon in great detail in a later chapter of this project. Yet even at this early stage, it is worth offering a couple of examples of the critical tactic that Warminski's second step allows us. It is of particular interest at this stage to step beyond the confines of Bacon studies for a moment to engage--or more precisely, to allow Bacon's text to engage--some of the more influential constructions of his thought by two prominent philosophers of science: Alfred North Whitehead and Karl Raimund Popper. Here, it is not my intention to engage the intellectual projects of the two thinkers, but rather to present in some detail their conception of Bacon's thought in order to demonstrate the pervasive reluctance to read Bacon that infects even the most important intellects of our philosophical and scientific milieu.

3. Bacon Reading Whitehead and Popper

Whitehead

It should be pointed out, before demonstrating the degree to which Whitehead fails to read Bacon, that Whitehead had a great deal of respect and empathy for seventeenth-century "genius," and Bacon's genius in particular. As he puts it, "the succeeding two

centuries and a quarter up to our own. . . have been living upon the accumulated capital of ideas provided. . . by the genius of the seventeenth century” (39). And in fact, Whitehead believed Bacon’s thinking “to have expressed a more fundamental truth” (42) as concerns the problem of nature than did the “materialist concepts” that were beginning to form the mainstay of physics. It is for this reason that his *Science and the Modern World* bases its conception of “organism” upon Bacon’s phenomenological anthropomorphism in his natural histories, particularly in the *Sylva Sylvarum*. Yet it is vital that we engage Whitehead’s attempts to read Bacon, perhaps for the very reason that Whitehead attributes such importance to Bacon as a figure(head) for the intellectual development of Western thought. It is Whitehead’s rendering of a passage from the *Sylva* which leads us toward the nature of his engagement and its blindneses. Whiteheads cites the following:

It is certain that all bodies whatsoever, though they have not sense, yet they have perception. . . and sometimes this perception, in some kind of bodies, is far more subtile than sense; so that sense is but a dull thing in comparison of it. . . It is therefore a subject of a very noble enquiry, to enquire of the more subtile perceptions; for it is another key to open nature, as well as the sense; and sometimes better. . . (cited in Whitehead, 42--my ellipses)

It is on the basis of the distinction between sense and perception, which Whitehead rewords by calling sense “taking account of,” and perception “cognitive experience,” that he launches a critique of Baconian induction; he admits that the passage itself does not explicitly refer to induction, but says that “the whole passage and the context in which it is embedded. . . are permeated through and through by the experimental method, that is to say, by attention to ‘irreducible and stubborn facts,’ and by the inductive method of eliciting general laws” (42). Whitehead will spend some time on the question of induction

without actually citing a relevant statement by Bacon on the subject (from, say, the *Novum Organum*, *The Advancement of Learning*, or the *De Augmentis*, where Bacon most properly undertakes to discuss induction¹⁶), but what is most important for us is the generalization concerning Bacon's efficacy as a thinker of the scientific ethos itself to which Whitehead is lead. Referring to the "purely qualitative character" of Bacon's thinking above, he writes:

In this respect Bacon completely missed the tonality which lay behind the success of seventeenth-century science. Science was becoming, and has remained, primarily quantitative. Search for measurable elements among your phenomena, and then search for relations between these measures of physical quantities. Bacon ignores this rule of science . . . We cannot ask that he should anticipate his younger contemporary Galileo, or his distant successor Newton. But he gives no hint that there should be a search for quantities. Perhaps he was misled by the current logical doctrines which had come down from Aristotle. For, in effect, these doctrines said to the physicist *classify* when they should have said *measure*. (45, original emphasis)

Even ignoring Whitehead's curious critique of the past for being behind the times, and the historiographical/methodological problems such a retroactive construction implies, Whitehead offers us here a completely mistaken notion of Bacon's ignorance of the "rule" of measurement, one that still persists. For quite to the contrary, Bacon does not simply hint that there is a need to search for quantities--he makes it a primary constituent of his project, one repeated across many of his texts. As he writes in the *Parasceve*:

Another precept is, that everything relating both to bodies and virtues in nature be set forth (as far as may be) numbered, weighed, measured, defined. For it is works we are in pursuit of, not speculations; and practical working comes of the due combination of physics and mathematics. (Robertson edition--406)

More convincing, perhaps, is the following from the *Novum Organum*, where in Book II Bacon speaks of “Mathematical Instances” or “Instances of Measurement”:

The chief cause of failure in operation. . .is the ill determination and measurement of the forces and actions of bodies. Now the forces and actions of bodies are circumscribed and measured, either by distances of space, or by moments of time, or by concentration of quantity, or by predominance of virtue. And unless these four things have been well and carefully weighed we shall have sciences fair perhaps in theory, but in practice inefficient. (220)

And finally, standing against Whitehead’s flimsy argument for the “purely qualitative character” of Bacon’s natural history, is Bacon’s own contention that “[n]othing duly investigated, nothing verified, nothing counted, weighed, or measured, is to be found in natural history; and what in observation is loose and vague, is in information deceptive and treacherous” (NO, 95).

Ultimately, we discover that Bacon did not “ignore” the “rule of science” that is to come after him (even if such a temporal contortion were possible). Bacon invents it. Whitehead’s reading of measurement is directly counter to Bacon’s clearly stated propositions on the subject, and they are directly counter because Whitehead did not read, in the most obvious sense.

We might well have spent far longer on Whitehead’s assessment of Bacon’s thought in this passage—we know, for example, that Bacon was not misled by the “logical doctrines” of Aristotle, since Aristotle is the one intellect who Bacon is most concerned to engage, and at times forcefully critique. It is also clear that Whitehead does indeed expect Bacon to read the minds of his predecessors, not realising, of course, that Galileo, Newton, and many more, will come to rely on their various readings of Bacon’s mind

instead. Still, I think our point is clear: in quite literally failing to read Bacon, as has increasingly become the case for commentaries on the Baconian programme, Bacon's own text must come to its own rescue, and in doing so, demonstrates that the critique launched by Whitehead against Bacon is, to the letter, the very critique that Bacon launches against the science of his time, an inversion so common among critical "non-readings" as to approach the status of a formalism within Bacon studies itself.¹⁷

Popper

Popper's failure to read Bacon's text is even more pronounced. I begin with a passage from *Conjectures and Refutations*, in which Popper sets the stage for his reading of the failures of Bacon's project by suggesting that Bacon's intent was to refute authority *as such*:

But I do not think that Bacon and Descartes succeeded in freeing their epistemologies from authority; not so much because they appealed to religious authority—to Nature or to God—but for an even deeper reason.

In spite of their individualistic tendencies, they did not dare appeal to our critical judgment—to your judgment or to mine; perhaps because they felt that this might lead to a subjectivism and to arbitrariness. Yet whatever the reason may have been, they certainly were unable to give up thinking in terms of authority, much as they wanted to do so. They could only replace one authority—that of Aristotle and the Bible—by another. Each of them appealed to a new authority; the one to *the authority of the senses*, and the other to *the authority of the intellect*. (*Conjectures*, 15)

If Bacon did resist the authority of the scholastics, by no means did he reject the necessity for authority itself, which is to say that there is no reason to believe, as Popper does, that Bacon "wanted" to "give up thinking in terms of authority".¹⁸ Why the question of authority, as Popper conceives it here at least, becomes germane at all is a mystery. Nor is it true that Bacon felt compelled to appeal to religious authority--as we shall

demonstrate shortly, Bacon's programme demands that religious authority be, if not completely rejected, then at the very least reconceived. Of greatest importance here however, because of its sheer inaccuracy, is Popper's suggestion that Bacon's recourse is to the authority of the senses--the instances in the *Novum Organum* alone where Bacon derogates the efficacy of the senses as an authoritative source of natural knowledge are almost too many to mention. One example here will suffice to make our point:

The sense fails in two ways. Sometimes it gives no information, sometimes it gives false information. For first, there are very many things which escape the sense, even when best disposed and no way obstructed, by reason either of subtlety of the whole body or the minuteness of the parts, or distance of place, or slowness or else swiftness of motion, or familiarity of the object, or other causes. And again, when the sense does apprehend a thing its apprehension is not much to be relied upon. For the testimony and information of the sense has reference always to man, not to the universe; and it is a great error to assert that the sense is the measure of things. (21)

Not only does Bacon himself refute Popper's understanding of the function of the senses, but the passage above also serves to refute other, more bizarre claims made by Popper that are based on the assumptions of the primacy of the senses. Popper's missed reading of Bacon rests, for example, on his version of Bacon's "epistemological optimism," a notion summarized by Popper with the phrase "truth is manifest" (5). Popper explains:

By the doctrine that truth is manifest I mean. . .the optimistic view that truth, if put before us naked, is always recognizable as truth. Thus truth, if it does not reveal itself, has only to be unveiled, or dis-covered. Once this is done, there is no need for further argument. We have been given eyes to see the truth, and the 'natural light' of reason to see it by. (7)¹⁹

Popper believes this epistemological optimism to be "at the heart" of the Baconian (and for that matter, the Cartesian) programme. It is certainly a strange claim, given the degree to which Bacon's efforts were oriented in terms of a scepticism for the epistemology of

his day, an epistemology identical to the one Popper articulates above. But Popper does not stop there:

They [Bacon and Descartes] taught that there was no need for any man to appeal to authority in matters of truth because each man carried the sources of knowledge in himself; either in his power of sense perception which he may use for careful observation of nature, or in his power of intellectual intuition which he may use to distinguish truth from falsehood. . ." (5)²⁰

Popper has pre-conditioned his version of epistemological optimism to speak to Platonic *anamnesis* and Socratic *maieutic*, both of which he will bring up to describe Baconian induction (and Cartesian intuition) a few pages later. It is as if his desire to be able to speak back to the Greeks overtakes his desire for accuracy, for a most cursory reading of Bacon's texts demonstrates that Bacon never "taught" any such thing. Needless to say, Bacon would have gravely mistrusted any suggestion that "man carried the sources of knowledge in himself," particularly given the degree to which induction was fashioned to combat the tendencies for syllogism to lean in precisely that direction. Furthermore, we might recall the final lines of the passage we cited from Bacon above--"For the testimony and information of the sense has reference always to man, not to the universe; and it is a great error to assert that the sense is the measure of things"-- in order to see how Bacon's text clearly rejects both of Popper's claims at once, i.e. that authority must rest with the senses, and that man is his ownmost source of knowledge. For Bacon, the senses are precisely what cannot be trusted, and "man" is precisely that being whose epistemological practices must never cease to be questioned and policed. Since each claim is to a great degree constitutive of the other, where one fails the other must as well.

Landing Place: Towards Reading

I have included these admittedly local critiques of Whitehead and Popper specifically in order to evoke not so much a canon of philosophy of science as a canon of remarkably misguided, while remarkably consistent, failures to read Bacon's text. What makes this contiguity even more interesting and important, perhaps, is that this reluctance to read Bacon is endemic to (and epidemic among) thinkers whose antipathy for each others projects is well known; Popper, for example, admitted to "hating" Whitehead's thought (and probably Whitehead too).²¹ Our intent here, I say again, is not so much to engage these debates, as to simply point out that such great epistemological disagreement can still, inconceivably perhaps, share a grounding common assumption concerning the importance of Bacon's thought.

One final point need be made. In placing Bacon's text alongside its critics, we come to discover that the Bacon being critiqued is not the Bacon in the text: in fact, whatever it is being critiqued is only so treated in order to more profoundly reproduce Bacon's thought in the critics work. The fact remains that we might have read Whitehead and Popper *with* Bacon, instead, as they themselves ask us to, against him. Indeed, Peter Urbach has already written of Popper's Baconianism.²² Both Whitehead and Popper, it becomes clear, attack straw-men that allow them to embrace Baconian assumptions—Bacon's programme is made to be the very opposite of what it is in order that the critic may become a Baconian, and still be a "critical" one.

Part II.

1. Tactics: Fish Reading Bacon, Bacon Reading Fish

The tactic we have used above--that is, placing Bacon's text alongside its constructions by Whitehead and Popper--is not an entirely new one, and the description of the nature of Whitehead's and Popper's missed readings helps to move us towards the formalization of a reading tactic that has already been given an important, if little recognized articulation. Stanley Fish's treatment of Bacon's *Essays*, found in *Self-Consuming Artifacts: The Experience of Seventeenth-Century Literature*,²³ provides us with a similar example of how it is possible to read Bacon's texts in the sense that we have outlined above. Much has to do with how Fish conceives the "experience" of reading, and the way that the production of meaning inheres in this experience. Fish offers two categories of experience when it comes to reading the seventeenth-century text--it is either "self-satisfying" or "self-consuming." By these categories he means to imply an explanatory, rather than necessarily taxonomic approach to the text, and in this sense claims to move outside of the circles of "party affiliation" that, as Fish goes on to show, tend to conceal more than they reveal about the meaning of the texts under study. Crucial to Fish's strategy is the attempt to answer the question "What is happening?" in the reading of a text "by tracing out the shape of the reading experience, that is by focusing on the mind in the act of making sense, rather than on the sense it finally (and often reductively) makes" (xii). We can see, immediately, the relationship that Fish's strategy has to our own, insofar as the "sense" that Baconianism has made of Bacon's text is precisely that which comes under interrogation even as we attempt to return Bacon's text to a field of readability. The distinction between the "sense made" and the "making (of) sense" is indeed a primary concern of our project, inasmuch as "sense made" might be said to

represent the kind of interpretation that the “making of sense” critiques. What this style of reading and questioning implies, quite significantly, is the inability to produce what Fish calls “generalizable results;” he goes on to say: “The experience of reading Milton’s *Areopagitica* is not at all like the experience of reading *The Reason of Church Government*. . . similarly, Bacon’s *Essays* make quite different demands on the reader than does *The Advancement of Learning*” (xii). Fish emphasizes that “reading has to be done every time,” and in this recalls for us Warminski’s stipulation that reading--reading--always depends on the specificity of the text being read. It is only the necessity for reading itself that is generalizable out of this largely tactical concern. In resisting the impulse for generalization, Fish believes that his two categories of reading experience--the self-satisfying and the self-consuming--will offer a different approach to the entire question of seventeenth-century stylistics, and it is worth dwelling for a moment on Fish’s rendering of this question in order to elucidate the importance that his thinking will have for the project before us.

What do these two reading experiences, the self-satisfying and the self-consuming, represent? This question must be asked in the context of the various debates concerning seventeenth-century prose style. The debates themselves rested on the problem of determining the nature of the various distinctions among competing prose models. Discussions of prose style, particularly in terms of the shift in dominant rhetorical modes from the early to late seventeenth-century, had been characteristically ordered according to a binary logic of classification, though the question of which classification best described the shift--Anglican versus Puritan, Painted versus Plain,

Ciceronian versus Senecan, Scientific versus Rhetorical, Utilitarian versus Frivolous-- depended largely on one's affiliation with a particular school. As Fish suggests, such binaristic attempts at classification are inadequate to the task of understanding seventeenth-century prose, insofar as such partisan affiliations tend to conceal the very stakes of the problem they try to elucidate. In this case, Fish demonstrates that it is not social, religious, or political opposition that is at stake, but rather the very epistemological fault-lines that make such conflicts possible (377-78). Once again, we notice a certain sympathy here with Warminski's remarks above, insofar as both suggest that the historical, the political, and the social cannot be made concrete markers for textual (or for that matter, rhetorical) meaning if some kind of--let us say textual-- interpretation has not first taken place; such precisely would be the implication of a shift towards the questioning concerning the epistemological, rather than taxonomic, movements of an epoch.

Fish's self-satisfying and self-consuming modes of readerly experience are meant, then, to speak to this shift in emphasis--away from the taxonomy that historical / social / political classifications tend to imply, and towards an interpretive effort meant to inquire concerning the very (textual) conditions of possibility of such classification. What is most important about this turn to epistemology is the (re)turn to language that, for Fish at least, it inevitably suggests. He explains the difference between the self-satisfying and the self-consuming in this way: ". . .the contrast holds, between a language that builds its readers' confidence by building an argument they can follow, and a language that, by calling

attention to the insufficiency of its own procedures, calls into question the sufficiency of the minds it unsettles” (378).

Bacon’s prose, according to Fish, is both—it is self-consuming in the *Essays* while it is self-satisfying in the scientific texts, like the *Advancement* or *Novum*. We will be better able to elaborate upon the importance of Fish’s thinking to our own, if we first understand why the distinction he makes here cannot ultimately be sustained by a reading of Bacon’s text. This distinction between the self-satisfying and the self-consuming, however valuable it may prove to be in helping to re-conceive the question of seventeenth-century prose stylistics, leads Fish to certain claims concerning Bacon’s philosophico-scientific texts in particular that would be hard to maintain.

On the one hand, Fish’s distinction enables him to expose some key difficulties with received critical conceptions of Bacon’s *Essays*. Robert Adolph’s suggestion, as Fish characterizes it—that the essays can be thought in terms of a “‘dispassionate survey of the available literature,’ a progression of ‘distilled certainties’ delivered in a language which, because it tends to ‘clarify, illustrate, restrict,’ reflects the philosopher’s ‘faith in the instructed intellect’” (379)—misses the point. For as Fish notes, the problem here is in the direct relation of prose style to intellectual or textual transparency/opacity; for Adolph, a plain prose style implies, *by definition*, that a text is easy to understand. As Fish deftly demonstrates (a demonstration to which we shall return in more detail in a moment), this is decidedly not the case. Indeed, Fish’s patient and meticulous reading of the *Essays* shows that quite the contrary is true; the plain prose style in Bacon’s hands is used precisely in order to trouble and confuse the various meanings which it is supposed

plainly to display. Fish's argument for the self-consuming features of Bacon's prose is, as we shall see, quite convincing.

Yet at the same time, on the other hand, Fish's claims concerning the *Advancement*, and also of the *Novum*, demand more scrutiny. It seems, that is, that Fish's desire to think in binaristic terms--i.e. the self-satisfying *versus* the self-consuming (significantly reproducing the *form*, if not the content, of the critical thinking that he challenges)--necessitates a certain misunderstanding of Bacon's program. If, as Fish is quite correct in noting, the plain style evinced in the *Essays* is by no means indicative of prosaic meaning, he maintains, conversely, that ". . .in the *Advancement of Learning*, the relationship is reversed: the prose is Ciceronian and full, the manner formal, the parade of learning formidable, and yet the experience is by and large comfortable, not without effort, but also not without the reward and satisfaction of following and comprehending an unfolding argument" (379).

As we shall maintain with some vigour, the reading of Bacon's scientific texts, from the *Advancement* to the *Novum*, is anything but comfortable. In fact, the sort of reading demanded by a text like the *Advancement* requires far more effort, and produces far less "sense", especially of the common kind, than Fish might have us believe. Part of the problem may lie, of course, simply with the emphasis of Fish's essay; he is more concerned to interrogate the *Essays* than the *Advancement* or any other of Bacon's scientific texts. Yet we cannot ignore the fact that he makes the deliberate move of casting the experience of reading the *Essays* alongside his reduction of the scientific program. It is in making this particular move that we notice how Fish deploys two

entirely different--and I would say largely incommensurate--reading strategies, one for the *Essays* and one for the scientific texts (especially the *Novum*). The difference in these strategies is first noticed in the material conditions of his text--of the seventy-seven pages directly concerning Bacon, only five are devoted to summarizing Bacon's philosophico-scientific position, while the rest is devoted to a meticulous reading, and in some cases rereading again, of just ten essays (though he gestures quickly to more), at one point spending some fourteen pages on "Of Friendship" alone.

The point to be made by this rather excessive emphasis on page-counting suggests that there are (at least) two ways of approaching Bacon's text--one that, relying on received wisdom, may safely reproduce critico-historical assumptions about the text, and one that is precisely intended to challenge those assumptions by decisively engaging the minutiae of the text itself. What results is the clear suggestion that Fish's construction of seventeenth-century reading experience in terms of the self-satisfying and self-consuming is eminently applicable to his own text as well.²⁴ Fish challenges the critical construction of the *Essays* by reading them against the claims of a number of critics (in much the same manner, in fact, that Bacon himself addressed the assumptions of his day concerning the various topics that comprise the essays). In this reading, he does not attempt to reduce the essays themselves to a list of characteristic statements or conceptions about them. Indeed, it is precisely this penchant in the criticism that allows Fish to launch so decisive an overhaul of our understanding of them; it is his tactic to quote frequently, and then carefully refute, various critical opinions concerning Bacon's obsession with objectivity, his lack of attention to form, and a number of other "peccadilloes" with which he is

usually, and too casually, charged. In this, Fish's text, like Bacon's, could be said to be self-consuming—it challenges, rather than confirms, our assumptions about Bacon's text.

Yet his understanding of the *Novum* is construed precisely in terms of traditional critical opinion of it, and summarizes, rather than reads, those opinions. The sort of rigour exemplified in his reading of the *Essays* is nowhere to be seen in his summarization of Bacon's "four crimes of the mind." And it is self-satisfying precisely because this paraphrase is so reasonable and logical. There is no challenge to received wisdom on Bacon's thought.

The difference here between self-consuming and self-satisfying really marks the difference, for our intents and purposes, between reading and interpretation as outlined above in our discussion of Warminski: Fish reads the *Essays* in a manner completely commensurate with our understanding of reading as elaborated above in Warminski's "second step," but he conceives Bacon's philosophico-scientific program in terms of a received interpretation of it, in terms of the "first step" of interpretation. The problem for us is not simply that Fish's text is split in this way; what troubles us is that Fish splits Bacon's oeuvre according to an externally derived reading strategy, rather than according to what is there, in the text, for the reading (or, for that matter, the interpreting).

We are in a position at this point to exemplify more clearly what is troubling, but also what is so valuable, about Fish's reading, by referring more closely to the text in hand. I shall compare, then, Fish's reading of the essay "Of Love" to the way in which he characterizes Bacon's "fourth crime of the mind." I begin here by quoting the section from "Of Love" that Fish himself uses to begin his reading:

You may observe, that amongst all the great and worthy persons (whereof the memory remaineth, either ancient or recent) there is not one that hath been transported to the mad degree of love: which shews that great spirits and great business do keep out this weak passion. You must except nevertheless Marcus Antonius, the half partner of the empire of Rome, and Appius Claudius, the decemvir and lawgiver; whereof the former was indeed a voluptuous man, and inordinate; but the latter was an austere and wise man: and therefore it seems (though rarely) that love can find entrance not only into an open heart, but also into a heart well fortified, if watch be not well kept. (81)²⁵

Fish's reading of this passage (pp 81-83) begins by noticing the purely self-satisfying nature of Bacon's opening declaration concerning love, that is, the degree to which its apodictic certainty is reinforced, and thus made reassuring, by the parenthetical "proof" that Bacon deploys to emphasize its all-encompassing scope. This certainty is still further reinforced by various rhetorical signposts and operators, like the "there is not one" phrase, the "which" clause at the end of the first sentence, and the opposing dyads of great/weak and business/passion. As Fish goes on to say, "The form of the whole is almost syllogistic, moving from the primary proposition--there are 'great and worthy persons'--to the secondary proposition--'there is not one that hath'--to the inevitable therefore--'which shews that'" (82). And insofar as we are presented with the internally coherent syllogistic form, the reader, for Fish, inevitably conceives this opening statement as nothing short of axiomatic.

The very next sentence, however, begins to cast doubt on the efficacy of this internally coherent characterization of the limits and effects of love. For here, Bacon offers certain exceptions--two "great" men are given as exceptions of the opening axiom. Even the qualifications are troubling, insofar as they themselves are not generalizable, even in negative terms; if Marcus Antonius is, in the end, weak for being "voluptuous"

and “inordinate,” thereby bringing greatness and weakness together in one, Appius Claudius, though open to the effects of love, is nevertheless characterized as “wise” and “austere.” The conflict between weakness and greatness is differently charged in each exception, making them irreducible to each other as exemplary figures of greatness (or, for that matter, weakness). Given this situation—at once exemplary and semantic—Fish suggests that “the emphasis of the entire experience [has] shifted from the original assertion to the classification of its exceptions, so that it now seems that *no* great man is immune from the infection of love” (83—original emphasis).

The manner in which Fish unravels Bacon’s unraveling of the syllogism is, of course, entirely consistent with Bacon’s refutation of the validity of the syllogism throughout his scientific program. Bacon emphasizes repeatedly that the syllogism fails precisely in its inability to account for or contain exceptions to the rules that they self-referentially create. We might be reminded here of Bacon’s strong rejection of the syllogism:

I therefore reject the syllogism, and that not only as regards principles (for to principles the logicians themselves do not apply it) but also as regards middle propositions, which, though obtainable no doubt by the syllogism, are, when so obtained, barren of works, remote from practice, and altogether unavailable for the active department of the sciences. (NO, 20)

It is precisely in being “remote from practice” that a truth, syllogistically derived, can avoid encounters with the very exceptions that would challenge it. Fish demonstrates how Bacon makes those exceptions precisely what is most important to consider; in this, Bacon does not simply announce the inefficacy of the syllogism, but demonstrates it, performs it, figures its self-consummation.

The result of this reading by Fish is a rather important reorientation of how we might conceive both the subjects and meanings of the *Essays* in general. When it comes to the question of love, for example, the value of Bacon's engagement with it does not come with the answer to the question of the clarification of love's meaning, but rather with the proliferation of questions concerning that intellectual trajectory's validity. Fish says of the essay on love that "it says nothing at all about the nominal subject, love; but as I have suggested earlier, the real subject of the essay is what men think about love, or, perhaps, *how* men think about love; and I would suggest further that the same formula should be applied to the other essays. . ." (91). Thus, "Of Love" does not clarify for us the nature of love itself, but instead, as Fish says, "[yields] much more: (1) a felt knowledge of the attraction generalities have for the mind and therefore a "caution" against a too easy acceptance of them in the future; (2) an awareness of the unresolved complexity of the matter under discussion; (3) an open and inquiring mind, one that is dissatisfied with the state of knowledge at the present time" (91). These three features of a revised understanding of the *Essays*, as Fish says, lead one to a state of "healthy perplexity;" this is, furthermore, what Fish believes to be the "mental set of the scientist, observant, methodical, cautious, skeptical, and yet, in long-range terms, optimistic" (91).

Above all, what Fish does in his reading of "Of Love," and what he does throughout his treatment of Bacon's essays, is complicate the received notions of not simply what the *Essays* mean, but how they mean as well. This is an absolutely crucial turn in the study of Bacon's *Essays*, insofar as we see Fish refuting and debunking, so convincingly, the traditional wisdom concerning the critical understanding of the *Essays*.

And surpassing even the fact that he does this may be the manner in which he does this; his tactic is to place the critical commentary beside Bacon's text, and to demonstrate in very precise terms those moments at which they are most at odds. In other words, Fish's reading is extremely *patient*; his readings of the *Essays* do not pounce upon the reader, nor are they offered as axiomatic, as so many of the critical articulations that Fish cites are. Fish's readings *unfold*, precisely in the manner in which Bacon's reading itself unfolds. Fish describes, then, what he would call the "arousal of the reader," which means nothing more, and nothing less, than a return to the reading of--to a sensitive attention to--the text.

We may have noticed, in passing, that the construction of Bacon that emerges from Fish's reading of the rhetorical movements of Bacon's text is, precisely, that of the scientist. Fish will already have made the important point that Bacon's scientific thinking--and by extension, science itself--cannot be construed in terms of an objectivity coeval with the scientific mind-set; indeed, to blithely associate science with objectivity creates the ground for the kinds of misreadings of Bacon's essays that Fish refutes so convincingly and with such rigour. There is, however, an important sense in which Fish will have had to misunderstand--or better, failed to read--Bacon's scientific program, and this even despite what we would consider to be Fish's illuminating re-elaboration of the relationship between Bacon's *Essays* and Bacon's science. It is true that Fish makes a very convincing case for his reading of the relationship between Bacon's scientific texts and his essays--citing a passage out of the *Advancement* in which Bacon speaks of the necessity to draw knowledge out of a study of particulars (89), Fish glosses the passage

as follows: “If you are committed to a proposition, you will find evidence to support it; but if a proposition is drawn from the evidence you disinterestedly find, your commitment is to truth” (89).

And yet, as this very example might demonstrate (particularly in the rhetoric of disinterestedness), there is an important sense in which the scientific texts are reduced--rendered self-satisfying--precisely in order to make the point more forcefully. Fish’s rendering of Bacon’s science inverts the order of reading that he had used to address the *Essays*--where we saw Fish painstakingly analyzing the essay on love sentence by sentence, phrase by phrase, his articulation of Bacon’s “fourth crime of the mind” (Fish’s phrase) depends instead on the self-evident coherence of the passages he cites as support to make his point. To contextualize: Fish is here intending to describe the function of mind in Bacon’s scientific thought in order to demonstrate the relationship between the *Essays* and Bacon’s philosophico-scientific thinking. He isolates four problems with the mind that Bacon believed to have an important effect on the production (and lack of production) of knowledge, and which Bacon suggested needed to be remedied: 1) the tendency to move too quickly to generalizations, 2) the tendency to equate human order with cosmic order, 3) the tendency to suppress questions that challenged syllogistically derived truth claims, 4) the tendency to privilege form over empirical evidence (84-85). For our exemplary purposes here, we shall isolate this fourth “crime.” It is presented to us by Fish, who formulates it (as he does the others) as a kind of axiom, followed by “proof” from Bacon’s text, the *Novum Organum*. The fourth crime of the mind is presented and proven in the following way:

4. A tendency to assent to forms--logical, rhythmical, syntactical--rather than to empirical evidence:

If you look at the method of them [presently received systems] and the divisions, they seem to embrace and comprise everything which can belong to the subject. And although these divisions are ill filled out and are, but as empty cases, still to the common mind they present the form and plan of a perfect science. (85 [Aph. lxxxvi])

It [the syllogism] is a thing most agreeable to the mind of man. For the mind of man is strangely eager to have something fixed and immovable, upon which in its wanderings and disquisitions it may securely rest. (85 [De Aug., Sp., IV, 428])

The first thing we might notice is the entirely different manner in which Fish chooses to read the *Novum Organum* and *De Augmentis* over against the *Essays*. Fish has presented the three prior “crimes” in exactly the same manner, and has used passages from Bacon’s thought to prove his own derivative axiom. He does not choose here to dwell on Bacon’s text, but rather allows it to stand as the (self)evidence of the axioms that he deduces from it. We see, then, an inverse reading strategy at work: while his reading of the essays depends on meticulous reading of the text of the essays, as we saw in his patient unraveling of Bacon’s essay “Of Love,” his characterization of Bacon’s science depends on *avoiding* the text of the *Novum Organum*, and this precisely by citing it in the service of a kind of critico-evidentiary discourse. Fish’s figuring of this fourth crime of the mind--the assent to form as a kind of resistance to evidence--is particularly interesting to us in this regard, precisely because his own critical practice takes a shape that is directly in opposition to the sentiment of this axiom: his isolation of, and proof for, this fourth crime of the mind is presented to us using what must surely be the most “formal” of critical tactics, the presentation of an idea supported by one or two passages from the text. And those passages are deemed to be so obviously in support of Fish’s deduction (and in all

fairness, this is not just Fish's deduction, but the deduction of four centuries of Bacon criticism), that there seems little reason here for even bothering to read them.

What happens when we *do* read them, especially against the claims for which Fish engages these passages, produces some important insights, or put better, blindnesses. We see, for example, that if Fish is quite accurate in suggesting that Bacon believes "man" to be most susceptible to the form of arguments, there is nevertheless a complete lack of corroboration for Fish's clear suggestion in his axiom that "empiricism" was Bacon's answer to this susceptibility. In fact, Bacon was as much against empiricism, narrowly conceived, as he was against the syllogism. For him, "the Empirical school of philosophy gives birth to dogmas more deformed and monstrous than the Sophistical or Rational school" (61), such that Fish's implied claim seems grossly to reduce Bacon's thinking in this regard. Bacon believes, moreover, that his program is best conceived as having "established forever a true and lawful marriage between the empirical and rational faculty, the unkind and ill-starred divorce and separation of which has thrown into confusion all the affairs of the human family" (14). Still again, Bacon will say towards the end of Book I of the *Novum* that "my course and method, as I have often clearly stated and would wish to state again, is this--not to extract works from works or experiments from experiments (*as an empiric*), but from works and experiments to extract causes and axioms, and again from those causes and axioms new works and experiments . . ." (107--my emphasis). Were Bacon to read Fish's reduction of his program as it is cast in the fourth crime of the mind above, he might suggest that Fish reproduces the very "divorce" that he tried to repair with his scientific program. In the

end, the reduction that takes place here in Fish's reading clearly misreads, by trying to interpret, Bacon's program, and thus misrecognizes that program's stakes.

What is of utmost interest to us is that, despite Fish's commitment to reading the *Essays*, the very form of his argument for Bacon's scientific program implies that we need not do so. It is not simply that Fish is wrong in his assessment of the four problems with the mind. The problem lies rather in determining the stakes of one's reading, and what clashes in Fish's essay are two incommensurable philosophical decisions concerning reading itself. On the one hand, we saw that Fish's reading of "Of Love" was not particularly concerned with what Bacon said, that is, with what presented itself, in the text, in a constative fashion--indeed, Fish convincingly demonstrated that Bacon himself was not particularly concerned with what the essay said either. Rather, what was at stake for Fish was that which was there, in the text, *for the reading*. And what was there for the reading--Bacon's dramatic unraveling of the syllogism precisely by staging what was most irrational about its impenetrable rationality--proved to be far more complex than anything that Bacon's critics might have understood Bacon to be "saying" with the essay. Yet at the same time, Fish's treatment of Bacon's science and the relation to the essays that he draws from that treatment depend entirely on dwelling on what Bacon "said," and not what was in the text--even in the quotations he cites--to be read. Fish relies largely on a strategy of interpretation of Bacon's thought, rather than on a strategy of reading Bacon's text. He uses the quotations from the *Novum Organum* as *evidence*, rather than as the fraught markers of the necessity to read.

What I say is most valuable to us about Fish's work, then, is precisely its doubleness in reading Bacon. It is so valuable because it at once demonstrates both how, and how not, to approach Bacon's text. The interpretive troubles into which Fish gets himself when dealing with Bacon's scientific text is not so much a symptom of misunderstanding Bacon's program (though this is the inevitable result) so much as it is a reflection of certain limitations in critical practice in general. For Fish, there is no question of treating the *Essays* with the utmost (philological) detail, yet it seems as if the magnified scope of Bacon's larger scientific program demands that we forego such detailed reading, and instead aim for more generalized interpretations of Bacon's thought that can be used to serve whatever purposes they may be called upon for the history/philosophy of science/ideas. This penchant is not, of course, endemic to Bacon studies alone, but can be said to characterize, in general, western critico-evidentiary discursive techniques. It will not be our task to interrogate such critical concerns in general,²⁶ but rather to come to an understanding of what such techniques, such critical formalisms, do and have done to our understanding of Bacon's text. This demands that we read Bacon's scientific text in a way that seems rather unprecedented--that is, following Fish's work, as if it were a Baconian essay, or alternately, against Fish's work, as if it were *not* an already received and internalized "corpus" of hypostatized philosophico-scientific statements.

2. Exemplary Reading: Nature and Religion

The strength of Fish's reading was found in his ability to place Baconian commentary alongside Bacon's text and, in essence, to allow Bacon's thinking--his text--to judge of

the efficacy and accuracy of the interpretations attributed to it. Such a tactic works best when the primary text differs obviously and markedly from its interpretation, and it is a mark of the degree to which we have misread Bacon over the last four hundred years that such a reading tactic is eminently suited to the unpacking of Bacon's thought. Fish himself, in his engagement with Bacon's scientific texts, exemplifies how even the very best of readers can still so obviously miss the mark in one's interpretation.

At this point, I want to turn to an exemplary demonstration of the decisive results that this new reading tactic can achieve when used to read texts of larger scope than just the *Essays*. I begin with two figures from Bacon's "scientific" thought in his *Novum Organism*--nature and religion--that might be said to have a certain "essayistic" provenance themselves, insofar as reading their respective functions in Bacon's text can seem much like reading one of his essays. One point should be made clear: I isolate nature and religion, and in particular the misunderstandings to which they have fallen victim, in order to exemplify my reading approach, not in order to solve the question of what nature or religion "is" to Bacon's thought. I do this so as to make the *style* of my reading, especially of Bacon's *Novum Organum* but also of other texts, more clear. Nevertheless, by reading various versions of what critics believe Bacon to have said about these fraught figures *against* what lies in the text to be read about them will no doubt suggest new ways to conceive these, and by extension, other crucial figures of Bacon's thought. The difference between what we read, and what is there to be read, comes to the foreground as the decisive question governing our entire project.

Nature

Nature and religion, construed in their broadest terms as concepts that have shaped in profound ways not only the intellectual milieu of early modernity, but the intellectual milieu of our own modernity as well, have never been far from pointed consideration when it comes to the text of Francis Bacon's philosophico-scientific thought. Nevertheless, it has become the case that the function of these two crucial figures in Bacon's scientific program have been received according to certain orthodoxies that, I feel, do more to conceal than reveal the stakes with which these concepts are invested by Bacon. Perhaps the most important thing to understand about the two concepts and their positioning in Bacon's work is precisely the fact that they *are* figures, and that they *do* function in this regard in order to unpack in various ways Bacon's most fundamental scientific and philosophical concerns. What follows, then, is my attempt to offer a new and more suggestive reading of the place of nature and religion in Bacon's thought. I have here chosen to dwell specifically on Book I of Bacon's *Novum Organum*, largely because it brings together in one place Bacon's most important articulations of nature and religion--discursive, rhetorical, theoretical--as they can be seen to occur throughout his oeuvre.

What interests us in the first instance about Bacon's concept of nature is the degree to which historical judgments concerning the relation between nature and science in Bacon's text have remained remarkably consistent, and remarkably one-sided. His thought is generally associated with the "conquering of nature," an ethos that has come to govern the belief, not entirely unfounded, that contemporary science and technology has developed a penchant for "beating nature into submission." Indeed, critics of current

scientific and technological practices often look back to Bacon, usually by miscontextualizing certain of his statements about nature, as the originary proponent of this ethos. Bacon's text does not, in fact, sustain such an interpretation, yet the belief persists to such an extent that Bacon has literally become a figure of, and the figurehead for, the invasive violence of the scientific endeavour.²⁷ It is most instructive, then, to look at such received conceptions of Bacon's thought not simply as they occur within the corpus of Bacon commentary, but as they occur beyond it, where they are most liable to be received without question. It is in these kinds of situations that such misreadings come to fuel a misunderstanding of Bacon's conception of nature that is capable of rendering his thought in terms of the very embodiment of the depths to which our treatment of nature has sunk. In what follows, what are often conceived as entirely separate discursive domains nevertheless manage to figure Bacon's thought in remarkably similar terms, precisely according to an ethos of violence against nature for which he--his very name--has become the place-holder. Indeed, the fact that a similar misreading of Bacon persists across such different discursive fields is perhaps the best indicator of the urgency with which we must now revisit the question of nature in his text.

A. Nature and the Feminine

In *What is Nature?*, Kate Soper attempts to engage the politics of the idea of nature, the "social and cultural demarcations which have been drawn through the concept"(3). One facet of those demarcations involves a certain recourse to Bacon, one common across many intellectual projects, in which the question of the feminization/sexualization of nature is taken up.²⁸ Soper sees the devaluation of women through a process of

naturalization to augur a reciprocal devaluation of nature because it is figured as female. Failing to realize how sinister her argument becomes the moment that it is forced to rely, for its critical force, on the *efficacy* of this reciprocity (an efficacy, that is to say, that one might rather seek to challenge at its very origin), Soper goes on to call upon a certain rhetorical thread in Bacon's thinking to bolster her claim:

Nature is both the generative source, but also the potential spouse of science, to be wooed, won, and if necessary forced to submit to intercourse. The Aristotelian philosophy, claimed Bacon, in arguing for an experimental science based on sensory observation, has left 'nature herself untouched and inviolate;' those working under its influence had done no more than 'catch and grasp' at her, when the point was 'to seize and detain her;' and the image of nature as the object of the eventually 'fully carnal' knowing of science is frequently encountered in Enlightenment thinking. . . (103)

Even if we should question Soper's strategy here, it would certainly be ill-advised to disagree with her characterization--the themes and figures she elicits are well known and obviously worthy of concerted critique. In this, it is not at all our intention to critique her project in general. It is, rather, to point out the way that Bacon gets used in arguments like this as a result of what seems to be our self-evident knowledge of his project. For upon closer examination, we see that Soper has unduly "re"contextualized phrases from disparate parts of Bacon's project that, while rhetorically amenable to her own argument, do not accurately capture his. We must put aside in the first instance, for example, her inaccurate characterization of Bacon's project as an "experimental science based on sensory observation," since it is well-known within the corpus of Bacon commentary that "sensory observation" is very much the object of a rigorous critique by Bacon. Her emphasis on metaphors of rape/coercion, furthermore, while certainly exposing a crucial

point of inquiry for the question of the sexualization of knowledge vis-à-vis the feminine in general, conveniently ignores the twin rhetorical thread of male submission and obeisance that is, for Bacon, just as crucial to the production of knowledge. In the *Novum Organum*, examples abound of Bacon's resistance to precisely the formulation of knowledge gathering described by Soper. We see, for example, that if indeed nature is to be "seized and detained," we must also, according to Bacon, "wait upon nature instead of vainly affecting to overrule her" (3); the same feminization exists here, but the rhetorical dynamics of sexual aggression are entirely dissipated by a certain strategic patience. Bacon feels compelled, furthermore, to point out twice in the *Insauratione Magna* that "Nature to be commanded must be obeyed" (29, 39), and he will repeat this suggestion yet again later on (118); "man," furthermore, must, for Bacon, be always and everywhere construed as the "servant and interpreter of nature" (29).

Ultimately, nature may indeed be the "spouse" of science, but *which* spouse it is (this crude and questionable figuring being the result of, and sanctioned by, Soper's rhetoric) is not easily determined if we remain sensitive to the rhetorical dynamics of Bacon's thought. We certainly are not saying that Bacon is some kind of feminist, and there is no question that Soper's isolation of a certain violence in Bacon's rhetoric deserves attention. But it cannot be attended to properly, I think, without due consideration of the entire context, both "ends," of that particular rhetorical thread. One might consider, for example, one of the most fraught of rhetorical moments concerning nature in Bacon's text, from Aphorism 117: "For I do not run off like a child after golden apples, but stake all on the victory of art over nature in the race. Nor do I make haste to

mow down the moss or the corn in blade, but wait for the harvest in its due season” (107). What is given with one (rhetorical) hand is taken back by the other: if Bacon figures the interrogation of nature as a race to won, it can only be won by being lost; as a thing to be chased, it can only be caught by waiting patiently for it. Perhaps most important here, however, is the degree to which the second statement does not simply counter the first, but also functions entirely *otherwise* to it—to juxtapose the figure of a race, and the victory it implies, with the figure of the harvest, where the stakes have changed entirely, is to render deeply ambivalent the very rhetoric of victory and violence that scholars almost exclusively dwell upon when discussing Bacon’s attitudes toward nature.²⁹ This kind of doubleness of rhetorical strategy, persistent throughout Bacon’s oeuvre, is routinely disregarded by scholars both from within and beyond the confines of Bacon commentary.³⁰

B. Nature and Utility

We turn now to a substantially different context. Alfred Schmidt’s book *The Concept of Nature in Marx* offers us a traditional conception of Bacon’s relation to nature in order to stage dialectically what Schmidt sees to be the radicality of Marx’s conception of nature. Schmidt emphasizes, in this regard, Marx’s use of the concept of “metabolism,” by which Marx meant to comprehend the social as well as “cosmic” significance of revolutionary material practices vis-à-vis nature. As Schmidt puts it, “by releasing the ‘slumbering powers’ of the material of nature, men ‘redeem’ it” (77). The result of Marx’s “metabolic” position is that now “nature is humanized while men are naturalized” (78). What is important to us about Marx’s metabolic thematic here is that Schmidt represents

it to be a departure from Marx's originally *Baconian* conception of nature: "With the concept of 'metabolism' Marx introduced a completely new understanding of man's relation to nature. At first he shared Bacon's view, which was inherited and developed by the Enlightenment, that nature should be seen essentially from the point of view of its usefulness to man" (78). Since a claim like this concerning Bacon's project can almost go without saying, it is no surprise here that it also goes without *citing*, which is to say that there seems to be no need to justify such a claim by recourse to Bacon's text.³¹ Again, it is not our point to critique, or even engage, Schmidt's project as a whole, but rather simply to make the point that Bacon's name, ill-advisedly, becomes the place-holder for a philosophical project that has been greatly reduced and misread. If, for example, there can be no question that, as Bacon says, (scientific) knowledge of nature is meant for "the benefit and use of life" (15), there is also a very clear sense in which his project must never be hypostatized as such. This point is worth dwelling on in some detail, perhaps most importantly because of a blatant (precisely because so innocuous) misprision of Bacon's thought here. Despite Schmidt's suggestion, the utility of *nature* has never been at stake for Bacon; rather, only the utility of the knowledge produced by a very specific and densely theorized method of inquiry has ever been at issue. Bacon himself makes this crucial, but usually ignored point in a rather remarkable way:

And if men have thought so much of some one particular discovery as to regard him as more than man who has been able by some benefit to make the whole human race his debtor, how much higher a thing to discover that by means of which all things else shall be discovered with ease! (119)

Coming as this does at the end of the purely theoretical Book I of the *Novum*,³² and marking one of the rarest of occurrences in Bacon's philosophical writings--the use of the

exclamatory--it remains something of a wonder that Bacon's project still continues to be figured and reified in exclusively practical/utilitarian terms. For Bacon speaks here of a purely and fundamentally reflexive moment in the constitution of scientific inquiry--the discovery of discovery--that has possessed his project since the *Advancement of Learning* 20 years earlier: ". . .it cannot be found strange if sciences be no farther discovered, if the art itself of invention and discovery hath been passed over" (122).³³ As he will go on to say in the *Novum* (repeating a fundamental point of the *Advancement*), "I regard that the mind, not only in its own faculties, but in its connection with things, must needs hold that the art of discovery may advance as discoveries advance" (120).³⁴

We see here that it is *this* question concerning utility--a purely reflexive one--that Bacon privileges above all else in the desire to disclose the secrets of nature, not simply the question of the *mere* utility of things. What is at stake here is precisely the question of how, and to what degree, Bacon theorized *utility itself*. This extended passage from the *Novum Organum* clarifies further Bacon's position:

Again, it will be thought, no doubt, that the goal and mark of knowledge which I myself set up (the very point which I object to in others) is not the true or the best, for that the contemplation of truth is a thing worthier and loftier than all utility and magnitude of works; and that this long and anxious dwelling with experience and matter and the fluctuations of individual things, drags down the mind to earth, or rather sinks it to a very Tartarus of turmoil and confusion, removing and withdrawing it from the serene tranquility of abstract wisdom, a condition far more heavenly. Now to this I readily assent, and indeed this which they point at as so much to be preferred *is the very thing of all others which I am about*. For I am building in the human understanding a true model of the world, such as it is in fact, not such as man's own reason would have it be. . .*Truth, therefore, and utility are here the very same things; and works themselves are of greater value as pledges of truth than as contributing to the comforts of life.* (113-114, my emphasis)

Bacon's words here belie an entire critical history in which Schmidt participates, one that sees Bacon's major contribution to the history of ideas to be the rhetoric of utilitarianism. This passage in particular, especially Bacon's words concerning the construction of a "true model of the world," are regularly cited without acknowledging their theoretical underpinnings and context as they obtain in a reflexive conception of knowledge production in the discovery of discovery. Citing only the final sentence of the above passage, for example, Timothy J. Reiss suggests that "we should not, here, allow ourselves to believe that Bacon is changing his emphasis, or downgrading "the improvement of men's lot" (211). Given what I have emphasized above, this is precisely what we *should* be doing. Or rather, we should be downgrading our emphasis on an interpretation of Bacon's text that, in the first instance, fails to read what is in the text to be read--it is not Bacon who is changing his emphasis, but rather modern critics and their readings who have failed to assess accurately that emphasis in the first instance. For here, as in our first example, there is a doubleness to Bacon's conception of utility--if "truth" and "utility" are "the very same things," Bacon nevertheless emphasizes that "works," the *raison d'être* of utility, must also speak back to their theoretical provenance. In this sense, utility cannot be used blithely to figure Bacon's project without first thinking carefully about how it functions. We have shown here that it remains a far more complex conception than received wisdom would have us believe, such that one of the very foundations of Bacon's thought concerning experimental method depends, precisely, on the production of *useless* knowledge. Bacon will later write:

But if objection be taken to speculative subtleties, what is to be said of the schoolmen, who have indulged in subtleties to such excess--in subtleties,

too, that were spent on words, or at any rate on popular notions (which is much the same thing), not on facts or nature; and such as were useless not only in their origin but also in their consequences; *and not like those I speak of, useless indeed for the present, but promising infinite utility hereafter.* (110-111)

“Useless,” in this instance, really implies “theoretical” knowledge, knowledge that announces the grounding conditions for utility itself. It is the manner in which scholars ignore or downplay the theoretical implications of Bacon’s project, I would suggest, that allows the rubric of a pure and “untheorized” utilitarianism to take hold over it.³⁵

Schmidt’s characterization of Bacon is useful to us in this regard, because it demonstrates precisely how Bacon’s conception of utilitarianism comes to be “de-theorized.” He makes the point, to begin, that Marx “never tired of emphasizing that men must remain in a continuous process of exchange with nature” (78). Yet this exchange is conceived in purely pragmatic terms, and Schmidt uses Bacon, once again, to bolster the pragmatism of this point: “The idea that men can only control nature by themselves submitting to nature’s laws is characteristic of the scientific outlook of the early bourgeois epoch. As Francis Bacon wrote in his *Novum Organum*, ‘nature is only subdued by submission,’ and theoretically recognized causes are converted into rules of practical behaviour” (95). Little recognition is given to the importance, rhetorical and otherwise, of Bacon’s “subdued by submission” ethos--we noticed during our discussion of Soper’s work, for example, how important a concept it is in offering us a different reading of Bacon’s project. Here, Schmidt at least recognizes the importance of this ethos, but he subdues its radicality by claiming that it represents, or recurs to, a template of practical (scientific) behaviour--this ethos becomes, not a mark of the suggestiveness

of Bacon's thinking, but, at best, a figure of and for scientific technique. As such, a concept that should force us to pause over received readings of Bacon's utilitarianism is instead marshaled in its service and forced to serve as the dialectical counter against which Marx's concept of nature can be elucidated. This elucidation can only come, however, at great cost to an understanding of Bacon's project. If Schmidt acknowledges a more complexly constituted concept of nature for Bacon than did Soper, it is nevertheless "dumbed down," as it were, by means of an interpretive manoeuvre meant, however unknowingly, to erase the theoretical stakes of Bacon's thinking.

C. Nature and Theory

Louis Dupré's recent book *Passage To Modernity*, written some 30 years after Schmidt's study, persists in both the association of Bacon's conception of nature with a utilitarianism and the concerted attempt to "de-theorize" Bacon's thought. Dupré contextualizes his discussion of Bacon in terms of the "emergence of objectivity" in the history of ideas, suggesting that it was Baconian utilitarianism (among other things), combined with a sort of divinely inspired ethos of mastery over nature (closely related to Soper's interpretation), that laid the grounds for later conceptions of objectivity, objectivity being conceived here in terms of the objectifying force of scientific inquiry. Dupré begins by suggesting, quite rightly perhaps, that "if the alleged modesty of Bacon's observational method is somewhat deceptive, so is his submissiveness to a divinely established order" (71). Yet Dupré has little understanding of the function of religion in Bacon's text,³⁶ and in this conceives Bacon's "voluntary submission to the divine oracles" to actually mark the deeper, more sinister purpose of "acquiring control of

nature” (71). In Dupré’s words, “Now the moment has arrived to recover that right [i.e., the divine right to know and thereby conquer] and to exercise the full power over nature granted us by divine bequest” (71). Indeed, Dupré goes so far along these lines as to suggest that Bacon implied we “avoid pursuing knowledge for any but practical reasons” (71). We have, by this point, left the realm of anything that Bacon’s text might offer for our reading in this regard, as our earlier discussion of the theoretical implications of Bacon’s project demonstrates, yet Dupré’s thinking is still accepted as a legitimate interpretation of Bacon’s thought precisely because it is the logical extension of received conceptions of it. So obvious do such conclusions seem, in fact, that it becomes quite easy to ignore Dupré’s complete avoidance (like Schmidt’s above) of direct engagement with Bacon’s text. When Dupré goes on to suggest that Bacon called for the “unlimited control over nature,” predicated on the belief in “unrestricted human power over nature” (72), he does so without offering us the crucial “other half” of Bacon’s argument (i.e. that “nature, to be commanded, must be obeyed.”) In avoiding the complexity of the question of nature, Dupré comes to explicitly de-theorize Bacon’s project in general: “Bacon tends to transfer the theoretical question: In what does a thing’s nature consist? to the functional one: How does it work? and ultimately to the one: What human purpose does it serve?” (72). Given Bacon’s insistence that new discoveries be able, above all, to enhance the “art of discovery” itself, and given the structure of his method in which the iterative movements between experiment and axiom contribute directly to this reflexive stipulation,³⁷ the “ultimate” question for Dupré, sanctioned as it may be by an entire history of Bacon commentary, must ultimately misrecognize the theoretical importance

of Bacon's interrogative strategy. Yet what is strange about Dupré's argument here is that even in the light of this de-theorization, he can at the same time suggest that Bacon "remains more devoted to the traditional ideal of *theoria* than his later followers" (72). Dupré does not seem to grasp the radicality of this claim which, I say, is precisely what is most important about Bacon's thought *and* the history that has tried to reify it. Despite his own critical instincts, even contrary to what he has read in the text, Dupré is still compelled by the very history of Baconianism to sustain an interpretation that is clearly inadequate to the text he interprets. The lack of reading here is *unknowingly deliberate*: how, we must ask ourselves, can Dupré make two largely incommensurate claims concerning Bacon's project--Bacon's thought resists theory even as it depends upon and embraces it--and yet unproblematically side with just one interpretation--Bacon avoids the theoretical in favour of the practical³⁸--an interpretation conditioned more by the text's received history than what the text itself offers?

We can conclude that Dupré has inadvertently reversed the interrogative movements of Bacon's project that he describes above. Recalling that Bacon thought "works" to be more valuable as "pledges of truth" than as figures of their potential utility to humanity, we can say with some confidence that the "ultimate" question regarding scientific inquiry for Bacon was decisively *not* "What human purpose does it serve?" Part of the problem for Dupré may be that he does not isolate the right question to begin with. If the question "In what does a thing's nature consist?" is a theoretical question, it is nevertheless not the theoretical question that drove Bacon's thinking. Rather, Bacon might be better understood to have asked "*How do we go about disclosing, discovering,*

that in which a thing's nature consists?" Dupré's question, which, to be fair, reproduces the assumptions of an entire critical tradition, completely ignores the centrality to Bacon's thinking of the ability of humanity, given the right methodological conditions, not simply to discover phenomena, but to pose the very questions necessary for discovery itself to obtain in the discoveries one makes. Bacon has never been conceived as being "capable" of this kind of self-reflection in his thought. Yet in fact, he is largely responsible for its existence as a philosophical possibility. Reading Bacon's conception of nature against commonplace interpretations of it, like Soper's, Schmidt's, and Dupré's, makes this abundantly clear.

D. Landing Place: The Command-Obey Imperative

What we should emphasize in our discussion of nature above, then, is Bacon's insistence on a sort of "double" relation to nature. It is not incorrect to suggest that Bacon's utilitarianism emerges out of, and reciprocally implies, a conception of nature in relation to which "man" can be conceived as a sort of invader, indeed, a conquering "general" as he himself sometimes put it. Yet at the same time, to dwell exclusively on this interpretation alone (sometimes for propagandist, sometimes for pejorative reasons) conceals every bit as much as it reveals about Bacon's thinking. For as we noted, and to reiterate, Bacon's text also offers a certain obeisance for, submission to, and patience with nature.

Now this point has not been altogether forgotten, and Michel Serres, in his *Hermes*, offers us crucial insight into the nature of this forgetting, as well as the stakes that this command-obeisance dyad represents for Bacon's project:

If we define nature as the set of objects with which the exact sciences are concerned at a given moment in history, viewed synchronically, (which is a restrictive but operational definition), the emergence of physics, in particular, can be thought of only in the global framework of our relations to nature. Now, ever since Francis Bacon's work, these relations have been described, from the heights of his social situation, by the command-obedience couplet. One commands nature only by obeying it. This is probably a political ideology--betrayed by the *prosopopeia*--which implies practices of ruse and subtlety: *in short, a whole strategy*. (21--my emphasis).

Bacon does not, that is to say, offer this dyad lightly, as "mere" rhetoric. What Serres isolates here are not only the political implications of this relationship, but the theoretical implications as well: Bacon's complications of the power relations between nature and the investigator--undertaken precisely by personifying nature, i.e. as something that can be either commanded or obeyed, the "*prosopopeia*" above--offers not simply a rhetorical flourish, but a fundamental constituent of his scientific program. In other words, Bacon explicitly acknowledges the necessity, when trying to disclose the secrets of nature, for a certain playful subtlety, or put otherwise, a kind of "give and take."³⁹

There is an absolutely crucial reason why Bacon would need to finesse, in this manner, the relationship between humanity and nature, and Serres recognizes it:

Descartes, after Bacon, picks up the precept: he calls for us to become the masters and possessors of nature. *The impulse to obey has just disappeared*. Baconian physics made science into a duel, a combat, a struggle, for domination; it gave it an agonistic model, proposing a form of ruse for it so that the *weak party* would triumph. It transformed science into a game of strategy, with its rules and its moves. (21--original emphasis).

For Bacon, the rhetoric with which so many contemporary critics and thinkers remain outraged is in fact marshaled as a strategy by which to engage a force--nature--that, precisely because of its clear superiority over humanity, *could not otherwise be engaged*.

Bacon reminds his readers, in Book II of the *Novum*, that the importance of the work he sets for himself is not its attempt to master nature, but rather simply to make the human intellect capable of engaging it in a scientific way. The “greatness” of the work he composes is precisely located, as he clearly states, in “rendering the human understanding *a match* for things and nature” (155—my emphasis). To ignore or forget the concept of obedience in Bacon’s program is to elide a fundamental, if nevertheless figurative, constituent of the enterprise he augurs. And to attribute to Bacon an ethos of domination over nature is to occlude a rather significant grounding strategy for him, one that depends on conceiving nature not as an entity to be forced to disclose its secrets, but as an entity capable of resisting our attempts to understand it unless we take to covert tactics. In other words, nature, for the first time, becomes “*studiable*;” in this regard, we might remember that part of Bacon’s problem with the scientific inquiry of his day was the tendency to give up if the problem seemed unsolvable: “But by far the greatest obstacle to the progress of science and to the undertaking of new tasks and provinces therein is found in this—that men despair and think things impossible” (90). And foremost among the “impossible” subjects of inquiry was precisely the “obscurity of nature” (90).

We see, then, that the characterizations of Soper, Schmidt, and Dupré, speak more of a desire to justify their (well intentioned, and completely understandable) distaste for a certain ethos of knowledge production contemporary today, than to investigate what Bacon’s own ethos might have been. It is the widespread reproduction of these and similar conceptions of Bacon’s understanding of nature that we have tried to redress, not only because they obscure Bacon’s thinking, but also because, in figuring Bacon thought

as a kind of precursor to contemporary abuses of nature, they come to obscure the stakes of our own relation to nature as well.

We now turn to the one figure in Bacon's writings that finds itself most intimately entwined with Bacon's conception of nature: religion.

Religion

What is important to remember, when approaching a discussion of religion in the *Novum Organum*, is Bacon's persistent attempt to draw lines of demarcation between it and science. Nature itself becomes the primary faultline in this attempt at discursive renovation, and Bacon's distinctions in this regard remain, for commentators, highly contested. One way for us to approach this question is to consider the degree to which Bacon's conceptions of nature have been historically constructed in terms of a Christian tradition of mastery over nature, a historical perception that, in many cases, remains largely responsible, either implicitly or explicitly, for the kinds of readings of nature that we addressed above. Such a tack leads us to a contradictory pocket of critical considerations in which Bacon becomes everything from the very figure of this Biblical tradition of mastery to the figure who should most be blamed for projecting upon this Biblical tradition his own voracious attempts at subduing nature.⁴⁰ What often gets lost in these discussions is Bacon's conception of religion's function in and for his program--just as nature was seen to be reductively construed by various commentators whose agendas obscured or precluded close consideration of Bacon's text, so too does the function and necessity of religion in Bacon's project remain similarly misunderstood.

A. Critical Orthodoxies

It has become an established commonplace that Bacon's thought overtly attempts to divorce religious and scientific discourses. John C. Briggs notes that Bacon himself stressed this point most vigorously, showing that "Even the acceptable hybrid 'divine philosophy,' when it is 'commixed together' with natural philosophy, leads to 'an heretical religion, and an imaginary and fabulous philosophy.'"⁴¹ The Royal Society, as Robert Markley points out, took Bacon's point to heart, noting that despite its being dominated by "prominent Anglican theologians and churchgoers," it "largely succeeded in remaining free from the kinds of religious controversies that characterized public debate in the 1650's."

Yet nevertheless, contemporary commentary on this issue has tended toward claiming for Bacon's religious sympathies (ephemeral as they may be) a place of primacy in his scientific project, and we have already seen strong hints of this in Dupré's work above. Evidently, when it comes to the question of nature, the ownmost object of Bacon's scientific program, religion re-introduces itself as a--and as many now claim, *the--* determining constituent of Bacon's philosophical ethos.⁴² Many have followed, for example, Charles Webster's suggestion that the Puritan conception of Bacon's project depends entirely on a putatively theological grounding:

Bacon gave precise and systematic expression to the anti-authoritarianism, inductivism, and utilitarianism which were such important factors in the Puritan scale of values. The metaphysical aspect of his philosophy avoided the atheistic tendencies which eventually rendered so much of the new philosophy anathema to the Protestants. Furthermore, Bacon's philosophy was explicitly conceived in the biblical and millenarian framework which was so congenial to the Puritans. (516)

It has been noted, more recently, that Bacon's Puritanism may have been purely strategic, rather than morally inspired.⁴³ Yet this does not diminish in the slightest what has remained the efficacy of Webster's reading for many, specifically concerning the degree to which Bacon's thought--most especially in the scientific texts--seems to make concerted use of a biblical tradition precisely in order to sanction many of its scientific claims.

I want to pursue, for a moment, the significance of what is being suggested here, especially the notion that Bacon's thought was "explicitly conceived in the biblical and millenarian framework." For it is precisely this suggestion that has come to endorse a particular way of understanding Bacon's use of religion that, despite his various statements to the contrary, conceives his approach to the scientific endeavour to be motivated by the very theological underpinnings that he tries to divorce from his theorizing. It is this theological motivation, discerned by Bacon's commentators, that has in turn grounded the readings of nature above, in which it becomes the *mere* object of the scientist's aggression and violence.

We might, to begin, return to Dupré's comments. As we recall, Dupré considered Bacon's putative desire for control over nature to be theologically motivated, the imperative of a so-called "divine bequest" by which "man" would recover the *right* to "exercise full power" over nature. Recently, John Hedley Brooke has corroborated this conception of the relation between nature-as-object-of-science and religion in Bacon's text. Brooke writes:

For all that he warned against the mixing of science and religion, Bacon remained convinced that scientific conclusions had to be limited by

religion. On issues such as the size and eternity of the universe, his own faith played a selective role, setting the conditions for admissible theories. An eternal universe, for example, was incompatible with a created universe, a universe that Bacon supposed would one day be liquidated by its creator. And as we saw [earlier], he gave science a religious sanction, in that it promised the restoration of a dominion over nature that had been God's intention for humanity. (57)

It is worth noting that Brooke's contention that Bacon's faith played a "selective" role in the determination of admissible cosmological theories avoids the true stakes of what theory choice meant to Bacon's scientific program.⁴⁴ What also strikes us here is the persistence of the suggestion that Bacon depended on religious sanction for an ethos that, as we have seen, he did not endorse. The fact that the question of mastery is far more complex in Bacon's thought than readings like this suggest implies a similar misprision with respect to the status of religion itself. Such misprision tends to ignore Bacon's own assertions to the contrary. One final, and very influential, example of this strand of commentary concerning Bacon's "mastery of nature" ethos can be found in William Leiss' book *The Domination of Nature*. For Leiss, scientific knowledge has been conceived, since the enlightenment, as both a means by which to assert mastery over nature, as well as an important instrument of "self-control by means of rational intelligence" (21). While Leiss connects this ethos of mastery most prominently to a Christian Biblical tradition, he suggests nevertheless that "Bacon's formulation of the idea [is] more than anything else. . .responsible for its wide modern currency" (32). Without citing exactly what that "formulation" was, he continues: "For Francis Bacon there was no apparent contradiction between his religion and his hopes for science--in

fact the image of man as the lord of nature helped him unite the two; but the Baconian synthesis, so characteristic of the seventeenth century, has not endured” (32).

It would be difficult to find support for Leiss’s claim in Bacon’s text. At least, it would be difficult to accept them without certain qualifications that stem directly from Bacon’s position concerning the relation between science and religion. As we shall demonstrate in some detail in a moment, Bacon saw a *profound* contradiction between religion and his “hopes” for science—religion is precisely that which could spoil his hopes entirely.⁴⁵ There is no wonder, then, that the “Baconian synthesis” of which Leiss speaks did not persist past the seventeenth century; *it never existed*.

B. The Luxation of Faith

We turn, then, to Bacon’s text in order to point out precisely how Bacon managed this separation of science and religion, a separation that has remained unconvincing for generations of scholars. For there is no question that, if Bacon does try to separate these discourses as incommensurable, the critical strategies used by the authors above demonstrate that there is surely an inordinate amount of religion in a text that claims to surpass and exceed it. Yet indeed, on the other hand, it has been precisely this situation that once prompted Fulton H. Anderson, in the introduction to his edition of the *Novum*, to make the claim that Bacon says very little about the divorce of science and religion: “These various pieces [comprising the *Novum* and its prefatory material], some brief, some lengthy, contain. . . only slight reference to his divorce of theological ontology from naturalistic metaphysics. . .” (xxxiii). Such a claim depends, of course, on understanding how Bacon conceived this discursive relationship, and there are, on the contrary, a

number of significant moments in the *Novum* that belie Anderson's claim.⁴⁶ At stake for us, however, is to determine the function of such ambivalent moments.

Briggs, for example, suggests that Bacon, through a series of rhetorical subterfuges and misdirections, succeeds precisely in *mixing* the two discourses, relying on the many instances in which Bacon claims that “there is no such enmity between God's word and his works” in order to suggest that “properly conceived, the new sciences provide a possible opening to the understanding of God's will by means of a new method” (175). He is also perfectly correct, furthermore, in noticing the “religious cast” of Bacon's language in the *Novum Organum*. Briggs's argument is more persuasive than those above precisely because it dwells on the language of Bacon's text in great detail. And yet, it seeks only to interpret this language according to the same set of assumptions that underwrite the conclusions of the likes of Brooke and Leiss. What I propose here, however, is that those moments at which Bacon seems to be invoking religion to sanction his scientific program are those moments at which he succeeds most profoundly in divorcing the two—the subterfuge lies not in mixing the two discourses, but precisely in *seeming* to mix them even as he renders them incommensurable.

Bacon does not merely perform this tricky tightrope-walk between science and religion; he explicitly theorizes the place of each discourse in his program, and this placing does not reflect an “intermingling” of science and religion at all. Bacon writes, in *The Advancement*, that “after the articles and principles of religion are placed and exempted from examination of reason, it is then permitted unto us to make derivations and inferences from and according to the analogy of them, for our better direction. *In*

nature, this holdeth not. . .” (211--my emphasis). Bacon’s distinction is not some kind of overarching metaphysical opinion, but, read closely, is grounded on very specific conditions underwriting the method he augurs. The fundamental distinction to be made between science and religion is the notion that the precepts of religion are not “examinable by reason,” whereas the precepts of science are. But what is just as significant here is the way in which Bacon is able to make this distinction efficacious by refusing to reject the importance of religion in these terms, a rejection that surely would have been disastrous. Bacon succeeds in divorcing science and religion precisely by making them *analogous*, emphasizing that religion does *not* determine the stakes of the inquiry, as the scholars above believe, but rather functions largely to exemplify and even perform those stakes; it is in this capacity that religion comes to function analogously to science, and thus asserts so profound a presence in his thought. To many, it seems as if Bacon is indeed “mixing” religion and science. But this interpretation only holds if we ignore what Bacon believed to be the largely rhetorical function of religion in his text, not as a putative grounding condition of his theorizing, but as an analogue for it, deployed generously throughout his texts in order to at once exemplify his claims while at the same time using the very nature of the “derivation” to announce a certain irreducibility in the relation between the science he offers, and the religion he uses to figure it. J. Samuel Preus has made a similar observation in suggesting that

theology, although still looked to for the legitimating *framework* of learning, had no intergral role in its actual *advancement*. Meanwhile, in opening up the vista of a total reconstruction of knowledge, Bacon was outlining a plan that would create new theoretical space for--among other things--a study of religion itself quite distinct from theology. (268--original emphasis)

By the time we reach the *Novum Organum*, Bacon has greatly honed the precision of this rhetorical tactic, moving from constative articulations of this discursive division to the performance of it, maintaining in this regard the strangely irreducible yet vitally proximate relation between science and religion. It is best, perhaps, to start with the very moment at which Bacon decisively divorces, while seeming to weave together, these two discourses. The following comes from *The Great Instauration* and is worth quoting at length:

Wherefore, seeing that these things do not depend upon myself, at the outset of the work I most humbly and fervently pray to God the Father, God the Son, and God the Holy Ghost, that remembering the sorrows of mankind and the pilgrimage of this our life wherein we wear out days few and evil, they will vouchsafe through my hands to endow the human family with new mercies. This likewise I humbly pray, that things human may not interfere with things divine, and that from the opening of the ways of sense and the increase in natural light there may arise in our minds no incredulity or darkness with regard to the divine mysteries, but rather that the understanding being thereby purified and purged of fancies and vanity, and yet not the less subject and entirely submissive to the divine oracles, may give to faith that which is faith's. Lastly, that knowledge being now discharged of that venom which the serpent infused into it, and which makes the mind of man to swell, we may not be wise above measure and sobriety, but cultivate truth in charity. (14-15)

A veritable hymn to Puritanism, with its rhetorics of charity and sobriety, humility and fervency, Bacon's encomium offers what would seem to be obvious corroboration for the various arguments that suppose Bacon to have "intermingled" science and religion. For indeed, if we are to give to faith that which is faith's, we must nevertheless do this in accordance with the "divine" oracles to which we are compelled to submit. Yet at the same time, this may be perhaps one of the strangest passages in all of Bacon's texts. Until the point that Bacon begins his prayer, he has dwelt exclusively on the problems that the question of scientific knowledge production has faced--the frailty of the senses, the

febleness of the mind, the lack of experimental and theoretical discipline, the misplaced stakes of inquiry itself--and what has dominated his discussion has been *himself*, that is, his personal outrage over the various epistemological blindnesses that have possessed both his intellectual forefathers and his contemporaries. The prayer, despite its pretension to humility, exhibits, precisely, a *pretension* to humility, for Bacon asks that God will "vouchsafe" to make him the instrument of secular overhaul. Yet even more, the requests that Bacon makes in all humility are precisely the kind of requests that one would not dare make of God if one were humble. If Bacon asks that "things human may not interfere with things divine," the inverse request--that the divine stay out of human affairs--is the reciprocal implication. Bacon's re-figuring of the words of Christ--i.e., "render unto Caesar what is Caesar's, and render unto God what is God's"--with his own--"give to faith that which is faith's"--can easily be taken for a self-evident reflection of Christ's words. Yet they must be understood rather in terms of their iterative force--a repetition of them, but with difference--for indeed, there is a profound difference between "rendering unto God" and "giving to faith." That difference lies with the fact that faith is re-figured outside of the loop of the human production of knowledge. Here, Bacon is sensitive to the rhetorical force of Christ's words; if one gives to Caesar in order that one may clear space to attend to God, Bacon inverts the movement of priority, such that one gives to faith in order to clear space for science. At stake is nothing less than the very epistemological arrangements that have ordered the priorities of his day governing the production of knowledge-- "God's creation" can no longer be taken on faith, but now must submit to the kinds of questions that, if the distinction between science and religion

be not made clear, could augur heresy. Bacon's subterfuge, then, is double; if he protects himself--i.e., the possibility of undertaking the project he proposes--by including religion in a certain way, he protects the project itself by excluding theological presuppositions, rendering them outside of anything but a figurative purview.

There can be no more forceful an example of the manner in which Bacon uses religion in order to clear space for his own project than in the words that directly follow this double-edged prayer. He continues:

And now, having said my prayers, I turn to men, to whom I have certain salutary admonitions to offer and certain fair requests to make. My first admonition (*which was also my prayer*) is that men confine the sense within the limits of duty in respect of things divine: for the sense is like the sun, which reveals the face of the earth but shuts up the face of heaven. My next, that in flying from this evil they fall not into the opposite error, which they will surely do if they think that the inquisition of nature is in any part interdicted or forbidden. (15--my emphasis)

In order to understand Bacon's demarcation of the discourses of science and religion, we need to notice the crucial shift in emphasis and strategy that takes place between Bacon's prayer and the "admonitions" that follow, a shift that does not mark a complete discursive rupture so much as a subtle luxation in the manner in which we conceive the respective places of the discourses themselves. It is the difference between a "prayer" and an "admonition" that should specifically concern us, especially the implications deriving from distinguishing between these two formal modes. The crucial point presented in both is that one must give to faith that which is faith's--stated explicitly in Bacon's prayer, it is reiterated in Bacon's admonition that "men confine the sense within the limits of duty in respect to things divine." In being reiterated--which is to say, *iterated*--a deliberate displacement is precipitated by a similarly deliberate rhetorical

shift. In the prayer, one *gives* to faith; in the admonition, one *confines* the sense. In this shift, we notice how a “giving” becomes, is meant precisely to be, a *taking away*. If, when addressing God, we promise to give to faith what is faith’s, nevertheless, when addressing men, this amounts to a kind of shriving of that which remains superfluous to the (scientific) task at hand. Bacon’s subsequent figuration of this iterative doubleness is meant precisely to imply this subtle yet crucial shift that has occurred in his rhetorical trajectory. For the sense, in being like the sun, at once offers us light/visibility and darkness/ “un”visibility--the sense, even as it might disclose the workings of nature (with the proper “helps,” of course), simultaneously closes off inquiry into questions of faith with its dazzling brilliance. So that what lies beyond the purview of the senses--i.e., the divine mysteries of God--are at once given and confined to the realm of faith. What we give to faith is precisely that which, when it comes to the question of scientific inquiry, lies outside of that inquiry’s field of relevance. To give to faith that which belongs to faith is, in essence, to give faith to faith, to leave faith with faith, to confine faith to its dark quarters in order that we may dwell instead with the “natural light of the mind” which, configured as strangely “otherwise” to the blindness with which the light of the sun--and the light of God’s divine mystery-- strikes us, emerges from a clear and unobscured “inquisition” into the nature of things, the nature of nature.

Bacon’s purpose in creating this tension between faith and sense is very deliberate--at issue is precisely the question of what it is possible to inquire about. It is this tension that will allow him, later on in the *Novum*, to address more aggressively this problem:

To the same result [i.e., the flawed admixture of religion and science], though in a different way, tend the speculations of those who have taken upon them to deduce the truth of the Christian religion from the principles of philosophers, and to confirm it by their authority, pompously solemnizing this union of the sense and faith as a lawful marriage, and entertaining men's minds with a pleasing variety of matter, but all the while disparaging things divine by mingling them with things human. (88)

Bacon's outrage is directed against those who would pollute the divine with the human, but as we already know from his original "prayer," in which precisely the issue of the relation between sense and faith was taken up in all its ambivalence, there is also much at stake for Bacon in keeping religion from polluting science. Again, what seems an obvious attempt to spare religion the degradation of sublunary contamination is in fact more subtly conceived as the inverse--Bacon's earlier prayer, in essence, "reads" this passage for us, reminding us that the stakes of this discursive distinction go both ways.

For Bacon, then, *everything* in nature open to sense, as well as everything in nature that remains undetectable by it, must be questionable, open to question. Bacon says his prayers here precisely in order to preempt the possibility of the ultimately unquestionable--i.e., the divine--exerting its influence over, or indeed, becoming the object of study of, a field of inquiry that he is at pains to make clear must be considered incommensurable with it. Thus, it is the moment at which Bacon "turns to men" in order to admonish them that religion--perhaps faith itself--is submitted to a kind of negative admonishment. This is the moment at which, in saying one's prayers, one creates a space for science, clears prayer itself from the purview of an inquiry no longer based on faith, one given over to an entirely different set of discursive controls. From now on, science and religion will never be the same.

And yet, they will always be infinitely proximate; the break we witness here between the discursive places of scientific and religious discourse is profoundly subtle, insofar as this break depends, as we saw Bacon say earlier in the *Advancement*, on conserving for religion a certain analogical function in his program. The problem with critical treatments of Bacon's thought in this regard has been the misrecognition of this function, a misrecognition which has led to the kinds of conclusions concerning religion in Bacon's thought that we have seen in the critics above.

We might close this discussion of religion by unpacking a few examples of how Bacon manages the rhetorical tension that he creates between religion and science--faith and sense--at those moments throughout the *Novum* where it is not religion in question, but science. In the examples above, Bacon was explicitly addressing the question of religion. But what happens to religion at those moments when Bacon's *scientific* aims are more properly at stake? How, that is, does Bacon manage his scientific claims in their vexed relation to the religious discourse that he hopes to remove from scientific concern?

Bacon speaks, at many points, of the lack of discipline in experimental research, of the tendency "from impatience to obtain in the shape of some new work an assurance for themselves that it is worth their while to go on," as well as "for the sake of the uses and fruits. . .of practice" (68). What Bacon proposes, in this regard, is recourse to the distinction between "experiments of fruit" which, while quite possibly producing some kind of result, do not advance the cause of science itself, and "experiments of light" which, properly conceived, advance the very "art of discovery." In order to bolster his

argument for the necessity of experiments of light, Bacon has recourse to a theological analogue:

But in the true course of experience, and in carrying it on to the effecting of new works, the divine wisdom and order must be our pattern. Now God on the first day of creation created light only, giving to that work an entire day, in which no material substance was created. So must we likewise from experience of every kind first endeavour to discover true causes and axioms; and seek for experiments of Light, not for experiments of Fruit. (68)

Here, like many places throughout Bacon's oeuvre, "divine wisdom and order" are the *pattern* for scientific inquiry. But it is not a methodological, or even theoretical, pattern, but most properly a performative pattern, an analogue, where the world's originary moment in Genesis is used to help figure the kind of experimental practice that Bacon recommends.⁴⁷ It is not a question here of "mixing" religion and science; religion can comment decisively on scientific practice only because, as an analogue of it science, it is irreducible to science. Here, then, we are meant to recall the "natural light" that for Bacon figures the true work of the understanding.

I might comment on one final example, for even as it strengthens our argument concerning the demarcation of religion and science, that is, of the way that Bacon makes of religion an analogical discourse in support of his scientific program, it seems directly to contradict the very terms of the program itself. For here, it is the "fruit" of experimentation that Bacon privileges. We read:

Some little [i.e., few discoveries] [have] indeed been produced by the industry of chemists; but it has been produced accidentally and in passing, or else by a kind of variation of experiments, such as mechanics use, and not by any art or theory. For the theory which they have devised rather confuses the experiments than aids them. They, too, who have busied themselves with natural magic, as they call it, have but few discoveries to show, and those trifling and imposture-like. Wherefore, as in religion we are warned to show our faith by works, so in

philosophy by the same rule the system should be judged of by its fruits, and pronounced frivolous if it be barren, more especially if, in place of fruits of grape and olive, it bear thorns and briers of dispute and contention. (72)

At first glance, Bacon's comments here seem to work against the grain of his theorizing on experiment, insofar as "works" come to mark the proper practice of scientific investigation. Yet much depends on precisely that to which "fruit" refers; in our previous example, the fruits of ill-conceived research practices do not refer themselves to the "art of discovery" itself, but only refer, in essence, to themselves, offering no theoretical projection of other possible experiments or discoveries, and are left languishing in the realm of solipsism. "Fruit" is differently conceived in the passage under consideration here--or rather, its range is extended. At issue for Bacon here is nothing less than the ability to recognize the theoretical grounding, or lack thereof, of a particular discovery. We note, for example, that it is theory that Bacon puts at stake in the above passage; the problem with the discoveries of the alchemists is that they do not lend themselves to the art of discovery. In this context, the "fruits" of an experiment become the signs of that experiment's efficacy in advancing the very cause of experiment. Bacon's use of religious analogy here is precisely what helps us to recognize the difference between this, a "good" fruit, and the negatively conceived fruit of "dispute and contention."⁴⁸ We notice, in particular, the minutiae of Bacon's simile: "as in religion we are warned to show our faith by works, so in philosophy by the same rule *the system* should be judged of by its fruits. . ." What is important to recognize here is that "fruit," the product of intellectual/experimental labour, does not refer simply to itself, as does the "experiment of fruit" seen in our previous example. Here, the experimental result in question already

presupposes the methodological or theoretical system to which it contributes by means of extending the range, not simply of the result, but of the theory by which that result became possible to achieve. And Bacon uses religion as an analogue in order to explain precisely this theoretical situation--the good works of faith beget more good works, precisely because they are at once the product of a (theological) system, and the very acts that valorize that system. When it comes to the question of science, experimental results must function, for Bacon, in the same way; as he says at the beginning of the aphorism from which we took our last passage, “. . .fruits and works are as it were sponsors and sureties for the truth of philosophies” (71). The theological analogy, with its emphasis on the relation between the “work” and the system that simultaneously valorizes and is valorized by it, provides for Bacon a context in which to situate the articulation of a methodological overhaul of the scientific practices he critiques. Religion and science, co-existing as analogues of one another, nevertheless maintain in Bacon’s thought a marked distinction. It is precisely this distinction that allows Bacon to use the two side by side in order to figure one another, creating the illusion that science and religion are intermingled, where in fact the opposite case is necessary for both discourses to maintain their explanatory and figurative efficacy.

3. Transition

For all of our reading so far, we have yet to read Bacon’s text. The tactics displayed above have only proven that Bacon’s text is capable of reading our own, and this precisely because we have failed to read his. If certain suggestions have emerged as to the ways in which nature and religion might be re-thought as constitutive parts of Bacon’s

scientific program, it has been no thanks to our interpretive efforts. For as we have seen, Bacon's text has been responsible for debunking the strange interpretations, myths, hallucinations, that have somehow come into being *despite* the text itself. We have marshaled the thinking of Warminski and Fish in order to demonstrate that precisely what constitutes this failure to read Bacon is nothing less than a reticence to, quite literally, crack the text. In other words, we have attempted in this opening chapter simply to clear space for the emergence of a text that has been occulted by its various interpretations and readings to such an extent that it has become nearly unrecognizable. It shall now be our intention to try to recognize it--its existence. No positive claim in this direction is possible, however, without first prying open its pages, and what follows shall be offered as something like a "primary reading." It is a foregone truth of critical practice, to be sure, that no critical reading can ever claim such originary status. Yet at the same time, Bacon's text seems to have been so completely forgotten by its interpreters that something like a fresh return to the text seems possible. It is in that fresh return that we may see new possibilities for interpreting--for reading--Bacon's text, and for understanding the great degree to which it not only informs, but indeed governs, the manner in which scientific knowledge production proceeds today. We turn, then, to the text of the *Instauratio Magna*.

Chapter Two

The Great Instauration Revisited

Part I

The Preface

It has often been the case, in attempting to unpack the nature and structure of Bacon's overhaul of scientific method, that critical commentary on Bacon's thought emphasises Book II of the *Novum Organum* as the textual site most germane to such an elaboration. In an excellent critique of received conceptions of Baconian induction, Mary Horton suggests that Book II of the *Novum* should really be the text taken most seriously when it comes to addressing Bacon's thought. As she writes of her own approach to the *Novum*,

Within *Novum Organum*, when contradictions appear, I have taken statements in Book 2 to have precedence over those in Book 1. Book 1 comprises, in Bacon's own words, 'the demolishing branch of our instauration,' in which he is clearing the ground for the introduction of his new method. In Book 1, Bacon the propagandist can be seen at work, exaggerating differences, simplifying descriptions, persuading the reader of the utility of the method he is going to put forward. In Book 2, Bacon the scientist is explaining and giving examples of his new scientific method, as simply and precisely as he can. It is therefore, primarily on Book 2 that this exposition is based. (242)⁴⁹

There can certainly be no question that Books I and II of the *Novum* represent different theoretical purposes or trajectories for Bacon, and in this regard, Horton's desire to choose between the two books is not altogether misplaced. But we might attempt to understand the grounds for this kind of decision in a different way, one that I

believe can offer more insight into Bacon's project than we might first suspect. If Horton is right to characterize Book II as the place where Bacon behaves most like "the scientist," speaking precisely and thinking practically, we must try to discern what it can mean to Bacon's project for him to behave, in Book I, like a "propagandist" whose tactics, at least for Horton, can sometimes seem questionable.⁵⁰ If Bacon is a propagandist, still, we cannot help but get the sense that there is far more at stake than simply propaganda for its own sake. For if Bacon calls Book I the "demolishing branch" of his "instauration," it is no less true that Bacon also sees himself laying the groundwork for the *reconstruction* of the sciences--for Bacon, there is "but one course left. . .to try the whole thing anew upon a better plan, and to commence a total *reconstruction* of sciences, arts, and all human knowledge, *raised upon proper foundations*" (4--my emphasis). Horton leaves us with the sense that Bacon was simply interested in dismantling the thought of his own day, and that he gave little consideration to the *theoretical* presuppositions--the "proper foundations"-- with which he would need to replace those in existence to give his project credence. In fact, it is precisely this penchant for critiquing a field of thought without subsequently offering an alternative that Bacon himself critiques:

Some, indeed, there have been who have gone more boldly to work and, taking it all for an open matter and giving their genius full play, have made a passage for themselves and their own opinions by pulling down and demolishing former ones; and yet all their stir has but little advanced the matter, since their aim has been not to extend philosophy and the arts in substance and value, but only to change doctrines and transfer the kingdom of opinions to themselves. . .(11)

To be sure, Bacon certainly hopes to “transfer the kingdom of opinions” to himself, but he adds an important criterion here, that is, the rhetoric of progress and advancement.⁵¹ In this regard, Bacon sees his project to offer the possibility of extending the breadth and scope of knowledge gathering itself, and it is in this that Bacon offers something “new” to the study of nature in his day. We see, then, that for Bacon, this work of “demolishing” cannot stand alone, but rather constitutes a fundamental step in, and one not always distinguishable from, the reconstruction of scientific knowledge production.⁵² Book II of the *Novum*, based as it is on the mechanics of this new method as Horton points out, cannot be the place to look for Bacon’s thoughts on the “foundations” of the overhaul in scientific method that he augurs, and it is to Book I that we shall look for Bacon’s unfolding of the philosophical presuppositions of his program. If, then, for Horton, Bacon’s propagandism is almost gratuitous, for Bacon, and for us, it harbours very serious stakes indeed.

1. The Epistemological Exaggeration

Those stakes are articulated immediately following Bacon’s call for the raising of knowledge upon the proper foundations. Recalling here that Bacon speaks of himself in the third person in the *Proem*, the first passage I cited above concerning the establishment of a new foundation for human knowledge continues:

And this, though in the project and undertaking it may seem a thing infinite and beyond all the powers of man, yet when it comes to be dealt with it will be found sound and sober, more so than what has been done hitherto. For of this there is some issue; whereas in what is now done in the matter of science there is only a whirling round about, and perpetual agitation, ending where it began. And although he was well aware how solitary an enterprise it is, and how hard a thing to win faith and credit for, nevertheless he was resolved not to abandon either it or himself, nor

to be deterred from trying and entering upon that one path which is open to the human mind. For better it is to make a beginning of that which may lead to something, than to engage in a perpetual struggle and pursuit in courses which have no exit. And certainly the two ways of contemplation are much like those two ways of action, so much celebrated, in this--that the one, arduous and difficult in the beginning, leads out at last into open country, while the other, seeming at first sight easy and free from obstruction, leads to pathless and precipitous places.
(4)

Horton might see a passage such as this to be the very epitome of Bacon's penchant for "exaggerating differences and simplifying descriptions," insofar as Bacon takes great rhetorical pains to figure the difference between the current method and that with which he means to replace it. And yet, as the passage begins, we see that it is precisely an exaggeration of a different kind--the Renaissance conception of nature's lack of accessibility to human scrutiny--that Bacon wishes to critique. What lies at the heart of this "epistemological exaggeration," as we shall term it here, is the very *form* of (scientific) questioning that Bacon will spend the greatest part of *The Great Instauration* and Book I of the *Novum* both demolishing and reconstituting. For Bacon, the structure of scientific questioning that has heretofore consumed contemplation of the world has come to exaggerate both the scientist's inflated conception of his own intellectual powers (i.e., an exaggeration of an exaggeration), while at the same time valorizing the belief that whatever remains unknown was never meant to be known at all. Bacon commentary routinely avoids the full and proper emphasis that Bacon's attention to this epistemological exaggeration deserves. And yet Bacon's continuous return, in his rhetorical manoeuvring, to the various ways in which this exaggeration, represented most prominently by the syllogism, "whirls about," is "perpetually

agitated” and otherwise follows paths that lead to pathlessness--all tropes that are repeated or iterated throughout his oeuvre--demand more than just an offhand characterization. Such figures are the very rhetorical core of Bacon’s project, and in large part serve to define the ethos against which the “new” foundation of science will seek to reconstitute itself.

At issue for Bacon, then, is a form of scientific questioning that, in reproducing the epistemological exaggeration, must necessarily produce a tautological structure of knowledge production, one that “whirls” about “without exit.” Bacon will eventually distinguish between useful and vicious circles in this regard, but it is important to realize, in these preliminary remarks from the *Proem*, that Bacon is laying down in very precise terms the core problems that will obsess not just the first half of the *Novum*, but to varying degrees his entire project. As such, we are given to think the importance of Book I in a new light--if Book II discusses the mechanics of his method, Book I marks the theoretical provenance of that mechanics. In other words, Book I--and we might even go further to say that it is really *The Great Instauration* that does this--lays down the very conditions of possibility of Bacon’s entire overhaul of the question of inquiry in general. Bacon must not, then, simply be conceived as a “scientist”--he must also, and more importantly, be understood to be a *theorist* of the scientific endeavour, in other words, a *philosopher* of science.

This is a large claim to make, not only because it resists the kind of place given his project by most Bacon commentary, but also because it announces Bacon’s project to be, in essence, a *theoretical, not a practical one*, and what follows shall be our

attempt to clarify what this can mean. But in the first instance, we might begin by saying that claiming Bacon's project to be "theoretical" in nature expands its conceptual horizons beyond the utilitarianism that is so blithely associated with his thought. To be sure, Bacon made every effort to demonstrate the utility of his method and its ability to generate useful scientific results. But as our reading of *The Great Instauration* shall demonstrate, such utilitarian concerns never superseded the theoretical decisions that made such utilitarianism possible. We have already encountered in our previous discussions of nature and religion the complexity with which utility is conceived by Bacon. It must now be the task of our reading to elaborate on the philosophico-theoretical presuppositions that ground his renovation of scientific inquiry.

2. The Pillars of Fate

Returning to the epistemological exaggeration of his own day, Bacon begins the *Preface of The Great Instauration* by elaborating upon what he sees to be the limitations of contemporary interrogative strategies:

It seems to me that men do not rightly understand either their store or their strength, but overrate the one and underrate the other. Hence it follows that either from an extravagant estimate of the value of the arts which they possess they seek no further, or else from too mean an estimate of their own powers they spend their strength in small matters and never put it fairly to the trial in those which go to the main. These are as the pillars of fate set in the path of knowledge. (7)

These "pillars of fate"--the Scylla and Charybdis of epistemology, as it were--are for Bacon the very scaffolding for the approach of his own day to the study of nature, a scaffolding that bolsters and supports contradictory and tautological approaches to the

question of natural inquiry. Bacon is pointing here to a profound inconsistency: the dialectici of his day at once believe themselves to have reached the very pinnacle of their intellectual powers even as they believe those powers to be entirely inadequate to the task of probing the deeper secrets of nature. Bacon seeks to surpass the false epistemology implied here by suggesting that the viciousness of the interrogative circle created by this relation between one's "store" and one's "strength" is closely related to the confidence held in one's interrogative strategies, a confidence that in turn is responsible for valorizing a certain reticence to engage nature's impenetrable obscurity.

As Bacon writes:

Nay, those very authors who have usurped a kind of dictatorship in the sciences and taken upon them to lay down the law with such confidence, yet when from time to time they come to themselves again, they fall to complaints of the subtlety of nature, the hiding places of truth, the obscurity of things, the entanglement of causes, the weakness of the human mind; wherein nevertheless they show themselves never the more modest, seeing that they will rather lay blame upon the common condition of men and nature than upon themselves. And then whatever any art fails to attain, they ever set it down upon the authority of that art itself as impossible of attainment; and how can art be found guilty when it is judge in its own cause? (10)

Bacon here elaborates in more detail upon the "pillars of fate" that impede a concerted investigation of nature, vividly dramatizing not only what is nearly a neurosis concerning the aporetic--subtle, occulted, obscured, entangled--nature of nature that haunts his intellectual milieu, but also the remarkably brazen confidence of the dialectici of his day that is engendered not despite, but *because of* this aporia. Just as important, however, for the purposes of understanding Bacon's overhaul of natural inquiry, is to recognize what is most pernicious about this contradiction. For Bacon

does not simply attack it—he isolates the *reflexive* mechanism by which the pillars of fate, so obviously contradictory and inadequate to the task of advancing knowledge, nevertheless maintain their efficacy as an intellectual ethos. It is, precisely, the “authority of the art itself” that sanctions what it can and cannot do, what is at once enlightening about, and beyond the purview of, its laws. This self-referentiality is responsible for limiting the scope of scientific knowledge, and Bacon proceeds to characterize the proponents of this authority according to the criterion of advancement that he introduced earlier: “Men of this kind, therefore, amend some things, but advance little, and improve the condition of knowledge, but do not extend its range” (11).

We cannot underestimate the significance of Bacon’s insight here. What Bacon calls into question is the lack of external criteria by which to judge one’s judgment. If the controls that govern the very “askability” of a question are internal to one’s presuppositions, then obviously, the range and scope of that which can be interrogated—indeed, the very possibility of interrogation itself—is proportionally limited. We certainly cannot claim that Bacon’s project of methodological overhaul is able ultimately or entirely to overcome this thorny theoretical difficulty. But what Bacon does accomplish by introducing the rhetoric of progress as a governing trope for this problem is a limiting of its surface effects—progress, as trope, is the means by which he circumvents the eminently rationalist claim that *because* of our brilliance, that which still remains unknown must by necessity forever remain beyond the purview of the human intellect.⁵³

In circumventing this rationalism, Bacon has been construed at all points to have replaced it with an empiricism, a reading based on what seems to be Bacon's clear reference to the self-evident categories of "experience," "fact," and "thing." Bacon says, first of all, that in order to extend the range of science, in order to surpass the vicious self-referentiality with which current techniques of scientific inquiry are burdened, we must turn toward nature itself, since "There is none who has dwelt upon experience and the facts of nature as long as is necessary" (11). We shall return in due course to the related questions of experience and the thing. For the moment, it is necessary that we interrogate precisely what it is that Bacon means by "a fact of nature," and more specifically, what it is that a "fact" represents. It has been easy enough to take this word for granted in our reading of Bacon's thought, usually attributing to it the commonplace association of a "datum of experience," the concept of "fact" that offers itself most obviously as a kind of place-holder for the sort of empiricism generally attributed to Bacon. We see how "fact" is often taken for granted in its application to Bacon's programme in suggestions, like R.E. Probst's, that "the inductive method described in the *New Organon*. . .demands a slow and cautious formulation of increasingly general statements about nature as more and more facts are accumulated" (579). Here, fact is a self-evident constituent of a concept of induction that is similarly construed to be self-evident. We also see it equated with reality itself--a purely empirical configuration--when Barry Levin glosses the above-cited passage on experience and the facts of nature by suggesting that, "in words less ornate and more up to date, the pleasure principle (Lustprinzip) must yield to the reality principle

(Realitätsprinzip)” (7).⁵⁴ It has become the case, in fact, that we no longer need even to cite Bacon’s text, so self evident has his thought become. Witness Heather L. Nadelman’s offhand remark, discussing Peirce’s epistemology, that “in no way did he condone the Baconian worship of raw facts over and above theory” (89).⁵⁵

Despite what must surely be its self-evident meaning to us, the fact remains that a “fact” for Bacon has very little to do with our conception of it, and where fact may now associate itself with empirical concerns, for Bacon, it was the index of the very theoretical concerns with which Bacon hoped to replace both the rationalism *and* empiricism of his day.⁵⁶ It is necessary, then, to make a brief detour through the implications that this singularly innocuous word holds for his project.

3. Facts on Trial

According to the OED, early usages in English of the word “fact” associated it with “an action, deed, a thing done or performed,” the very definition of the latin *factum*. This alone is enough for us to significantly expand our conception of fact as a mere “datum of experience” construed as “independent of inference,” insofar as the fact conceived as a kind of brute or primal experience is given a more dynamic association in Bacon’s use of *factum*--a fact of nature would imply an attendant anthropomorphism (we might recall here our discussion of Serres’ thinking on the command-obedience dyad earlier in the project). But there is one meaning for the word, now obsolete, to which we need to pay very particular attention, since this meaning is attributed by the OED to Francis Bacon himself. It states that a fact is “an action cognizable in law,” and given the degree to which this understanding of fact seems to operate entirely otherwise

to the definition with which we are most familiar, it seems clear that there is more to Bacon's call for a recourse to the "facts of nature" than would at first appear.

Specifically, it is necessary that we discern precisely that which is "new" about this now obsolete definition, and how it, rather than our commonplace conception, can help to disclose the true stakes of Bacon's turn to nature in defiance of the pillars of fate.

An action cognizable in law is an action capable of being made known legally, that is, according to the presuppositions of legal discourse. The word "cognizable" itself has an important legal connotation, such that any action that can be called cognizable can be considered an action susceptible of being legally tried, or otherwise falling within the jurisdiction of a court of law. A fact, then, as an action cognizable in law, is not just subject to, but also *determined by*, the discursive arrangements and limits according to which it may be judged, put on trial.

In emphasizing, by necessity it seems, the prominence of legal discourse in Bacon's conception of fact, we have embarked on a detour of some complexity in our attempt to determine what he means by the "facts of nature." At first, this almost entirely legal concept of fact may seem to have little bearing on the stakes of Bacon's project, insofar as it would not be impossible--Bacon being a lawyer, after all--to conceive him to be thinking fact, in the definition above, *only* in legal terms, and only with the legal profession in view. As Roger T. Simonds has noted, however, there is evidence to suggest that while Bacon is forced to abandon his project of law reform after James comes to power (in no small part because of his emphasis on his philosophical programme), his legal interests "had more than a little to do with his

philosophical ideas and his peculiar ways of expressing them” (497). Indeed, Simonds suggests that Bacon, taking the language of law as precedent, (where changes in law did not always create changes in language), “might introduce radical novelties into philosophy without revealing them to a casual reader” (498). This, I suggest, is precisely the case with a term like fact, whose semantic relationship to the fields of both law and science make it an ideal term for precisely this kind of figurative novelty. Furthermore, it is this legal conception of fact that allows Bacon to demand recourse to the “facts of nature” without necessarily implying the empiricism that today we so readily associate with the phrase. If for us a fact is a “datum of experience,” it is still this to a certain degree for Bacon. But this datum is not self-evidently present in Bacon’s paradigm *as such*--it is only datum at all insofar as it is *made known* according to the presuppositions of the discourse responsible for judging, or *trying*, it. It is the necessity for the presence of a *determining* (i.e., legal, but also scientific) discursive model for a fact to be a fact that offers us crucial insight into the “facts of nature” as Bacon conceived them. Our discussion of Bacon’s critique of the tautological consequences of misvaluing the “store and strength” of human knowledge and intellect has already demonstrated, if in a preliminary way, the central place in Bacon’s attempt to reconstruct the sciences for a theoretical model of inquiry put in place precisely in order to help the senses and the intellect “judge of the thing.” It is no great leap to suggest here that Bacon’s conception of fact, construed in the context of his scientific program, demands to be understood in terms similar to those governing its legal conception. The facts of nature, then, are not to be construed as the “datum of experience” at all, but

rather those “deeds and actions” of nature that can be made known according to the presuppositions of a scientific method. Far from auguring an empiricism, such a concept of fact demands that it be construed in terms of the *theoretical* articulations of scientific advance according to which Bacon hopes to engage nature itself. A fact, in this instance, must at all points imply the conditions under which it is cognizable, made knowable--*able to be tried* by the scientist within his epistemological jurisdiction.⁵⁷ A fact becomes the *index* of Bacon’s theoretical program, and it is this complex conception that we must keep ever before us when reading Bacon’s text.

We are now in a position to return to our initial starting point in Bacon’s suggestion that “There is none who has dwelt upon experience and the facts of nature as long as is necessary.” Specifically, we might now take this revised understanding of what a fact is for Bacon, and attempt to address the manner in which it speaks to Bacon’s philosophical aims vis-à-vis the scientific practices of the thinkers of his day:

For they have been content to follow probable reasons and are carried round in a whirl of arguments, and in the promiscuous liberty of search have relaxed the severity of inquiry. There is none who has dwelt upon experience and the facts of nature as long as is necessary. Some there are indeed who have committed themselves to the waves of experience and almost turned mechanics, yet these again have in their very experiments pursued a kind of wandering inquiry, *without any regular system of operations*. And besides they have mostly proposed to themselves certain petty tasks, taking it for a great matter to work out some single discovery--a course of proceeding at once poor in aim and unskillful in design. *For no man can rightly and successfully investigate the nature of anything in the thing itself.* . . .(11--my emphasis)

Bacon’s conception of fact, one that implies the necessity for a (theoretical) model of the world to be in place before a fact can become a fact at all, is perfectly commensurate with the context in which it appears; here, Bacon critiques the lack of

direction--figured, much as we saw earlier on, in terms of the "whirling argument," the "wandering inquiry," and the "promiscuous liberty of search"--in attempts to investigate nature without a methodological strategy in place prior to the act of critique. It should be noted in this determination that Bacon's recourse to the facts of nature cannot refer to a brute empiricism and still remain consistent with his desire to lay down a "regular system of operations." Attempts to make "fact" function in this empirical manner fail to take account of Bacon's own very specific understanding of the term.

But this passage is important for more than just its demonstration of a new context for the figure of "fact" in Bacon's project. It is also a marshaling point for Bacon's attempt to surpass the "pillars of fate" that, in large part, perpetuate the intellectual pathology figured by "whirling," "wandering," and "promiscuous" approaches to the study of nature. These figures of misdirection and misrecognition are that marshaling point, insofar as they name that feature of the intellectual practices of his day that Bacon is most concerned to revisit and revise. Of particular importance here is the nature of his critique of the investigator who "proposes. . . certain petty tasks, taking it for a great matter to work out some single discovery. . ." We should not confuse this "petty" task with Bacon's emphasis on the "mean or even filthy" in his own approach to nature, for this attempt to work out a "single" discovery betrays precisely the fact that it is not grounded in a "regular system of operations." As such, it cannot conform to what is perhaps the most important criterion of efficacy for the experiment/investigation in general--that it, above all, be productive of further

experiments.⁵⁸ But what is more, this “petty task” is suggestive of the tautological structure that constitutes even more fundamentally the intellectual outlook that Bacon is most concerned to overthrow. For in this petty task, the only judge of its experimental efficacy or epistemological coherence is the set of assumptions for which it is itself the proof. Such emphasis on a “single discovery” shrinks the theoretical or philosophical range of the experiment in order to create for itself a self-referential context in which the assumptions under which it is produced will also be those that judge of its efficacy *as* an experiment. It is for the purpose of critiquing this kind of circularity that the final lines of the passage cited above are so important: “For no man can rightly and successfully investigate the nature of anything in the thing itself. . .” This strangely counter-intuitive moment has crucial consequences for the stakes of Bacon’s project, insofar as in rejecting the “thing itself” as the *source* of its own (self)knowledge, one must also necessarily reject the self-referentiality of knowledge production in general. Here, Bacon’s own thinking runs counter to the manner in which his thought has been constructed; notice, for example, how Charles Whitney—one of Bacon’s most cited commentators—entirely misconstrues the question of the thing in Bacon’s thought: “With Bacon, revolution reduces and unmask; it is not dialectical but, like many other “bourgeois” concepts of revolution, seeks direct encounter with “things as they are” and plain, denotative language for this encounter” (14). One cannot help question the perspicacity of such a statement given Bacon’s direct contradiction of it. And as our reading of Fish had demonstrated, if Bacon did ultimately desire “plain, denotative language,” he nevertheless knew this to be only an ideal given the vagaries of the Idols

of the Market Place. So again, Bacon approaches his critique of the pillars of fate from yet another attitude, suggesting that the “thing,” without a theoretical model in place to make it knowable, cannot stand solely as the ground for scientific investigation; to allow the “thing” this sort of epistemological status would, of course, lead to the very empiricism that Bacon rejects.

4. Working the Oracle

What Bacon has forged here is a strong connection, both rhetorical and thematic, between the “fact” and the “thing”: both are used in tandem by Bacon to offer different but related critical trajectories in his challenge to contemporary epistemology.

Bacon will, in fact, repeat this rhetorico-thematic connection just moments later:

For all those who before me have applied themselves to the invention of arts have but cast a glance or two upon facts and examples and experience, and straightway proceeded, as if invention were nothing more than an exercise of thought, to invoke their own spirits to give them oracles. I, on the contrary, dwelling purely and constantly among the facts of nature, withdraw my intellect from them no further than may suffice to let the images and rays of natural objects meet in a point, as they do in the sense of vision; whence it follows that the strength and excellence of the wit has but little to do in the matter. . . I have not sought (I say) nor do I seek either to force or ensnare men’s judgments, but I lead them to things themselves, and the concordances of things, that they may see for themselves what they have, what they can dispute, what they can add or contribute to the common stock. (13-14)

Bacon begins here, yet again, by using facts, examples, and experience, as a set of epistemological criteria with which to critique a mode of inquiry concerned only to represent the production and limits of knowledge according to its own assumptions.

Bacon’s figuring of this mode, in which the thinkers of his day “invoke their own spirits to give them oracles,” is a particularly potent one, for in this determination, what

is at first seen to come down as knowledge true and pure from within the confines of a particular set of assumptions is ultimately revealed to be a mere index of those assumptions themselves. These “oracles” of knowledge are in fact “secretly influenced,” “bought off,” or otherwise co-opted reflections, not of the epistemological efficacy of a particular set of presuppositions, but of the authority whose judgment precludes any other epistemological possibility. In other words, these oracles are *worked* rather than interpreted (or read), and as such must be disqualified as legitimate sources of theoretical and natural knowledge. In this critique emerges the first of many strategies that Bacon announces for seeing past these self-determined, and self-determining, oracles. As he says, “I, on the contrary, dwelling purely and constantly among the facts of nature, withdraw my intellect no further than may suffice to let the images and rays of natural objects meet in a point, as they do in the sense of vision; whence it follows that the strength and excellence of the wit has but little to do in the matter.” It would be simple enough to construe a moment like this as an example of Bacon attempting to replace a rationalism with an empiricism, insofar as this empiricism seems to be suggested by the objectivity that must necessarily inhere in any effort to “withdraw” from nature in order to apprehend its workings. But again, such an interpretation would not be consistent with Bacon’s grounding conception of a “fact of nature” as we have outlined it above. Knowing that a fact of nature cannot represent a thing of nature invariably reorients the significance of this particular passage entirely, for if the facts of nature that Bacon so prominently emphasizes do not imply an empiricism or its attendant “objectivity,” then we must look to some other explanation

for the “withdrawal” of which Bacon speaks. We recall that to “dwell purely and constantly with the facts of nature” must suggest a dwelling with the conditions under which those facts can disclose themselves *as* facts. In this light, what Bacon announces here emerges as the first move in his attempt to replace tautology with an externally realized strategy of critique. Indeed, Bacon’s suggestion that “the strength and excellence of the wit” has nothing to do with the efficacy of an investigation serves primarily as an indicator of the degree to which “facts of nature,” *as* facts of nature, refer to a style of inquiry that resists the highly intellectualized constraints of traditional conceptions of knowledge production. To be sure, Bacon walks a very fine line between the empiricism and the rationalism that he attempts to divorce from his project (precisely, of course, by “re-marrying” them), but he walks this line with remarkable (rhetorical) subtlety. For like a rationalist, he does indeed “withdraw the intellect,” but like an empiricist, he does so “only so far”--Bacon, in being both, is neither. And even when it is the (rational) intellect that withdraws, it behaves *as if* it were the most crucial of (empirical) senses, sight.

The new position that Bacon announces here vis-à-vis natural objects is offered in order to lead men’s judgments “to things themselves, and the concordances of things, that they may see for themselves what they have, what they can dispute, what they can add and contribute to the common stock.” Bacon will later take up precisely what this “common stock” to which men can contribute implies in terms of a new and reconceived form of natural history, and we shall address this in due course. For the moment, it is once again the question of the “thing” that Bacon uses to separate his own

theoretical position from that of the Renaissance logician's which he critiques. We are faced in this passage with what is perhaps the strongest evidence for a Baconian empiricism, since recourse to the "things themselves" implies the kind of phenomenology that, in the context of scientific study, could not easily be construed in any other terms. Yet our reading so far has stressed that Bacon's critique of his day's epistemology cannot possibly be construed in this way. How, then, are we to proceed?

We must begin by remembering that the "thing," especially when cast alongside the self-referential movements of knowledge production that Bacon critiques, had, in Bacon's mind, quite literally disappeared as an epistemological concern in the study of nature. We saw earlier how that which could not be made knowable within the constraints of a given set of epistemological assumptions was assumed, precisely on the basis of those assumptions, to be entirely unknowable. Bacon's recourse to the "thing" here is indicated precisely in order to circumvent, to force a breach in, this hermetic seal in rationalist inquiry. So if Bacon leads us to things themselves, we must still keep ever before us the fact that this is not an empirical move, but a *strategic* one, one that is meant first and foremost to announce its difference from the intellectual retreat from the world that he saw to symptomatize natural inquiry of his day. *No longer must the form of questioning take precedence over that which is being questioned*: this is, in its proper context, a remarkable, even groundbreaking insight. And we avoid the empiricism that such an insight might imply in recalling Bacon's crucial suggestion, seen earlier, that we can never determine the nature of the thing in the thing itself. This is, then, precisely, a *leading* to things themselves--it is the "leading," not the "thing," that is

most properly at stake for Bacon here. (We shall see in a moment precisely how this strategic move manifests itself in terms of a theoretical re-orientation of the nature of how one questions in general).

The passage cited at the beginning of this exposition, taken together, asks that we attend more closely to the strategy of Bacon's attempt to reconstruct the sciences. Here, what surely seem to be self-evident articulations of empirical categories--i.e., fact, or thing--are not at all what they appear.

5. Theorizing Use

It is becoming apparent, I think, that the "pillars of fate," a figure for the foibles of the epistemology of Bacon's day, is more than just a figure. It names the Renaissance logician's self-imposed limitation on the scope of what it is possible to inquire about, and as such, represents a vicious self-referentiality that Bacon, whose intent in *The Great Instauration* is to begin the work of "reconstructing" the foundations of the sciences, attempts most directly to critique. Yet what is also emerging here is a conception of Bacon's project that is not at all consistent with the many attempts to associate it with an empiricism, and most significantly, its attendant utilitarianism. For certainly, Bacon's understanding of "fact," so at odds with our own, or his displacement of the "thing" as a source of knowledge in order to recast it as the strategic site of knowledge *production*, speak to entirely different concerns. It is, precisely, to the question of utilitarianism to which I would like to turn once again in order to unpack in more detail some of the grounding presuppositions of Bacon's project.

It helps to ground our discussion by first recalling the manner in which Bacon's project has been figured as a utilitarianism or empiricism over the last fifty or so years by his commentators. Benjamin Farrington, for example, accounted it as Bacon's "lifelong" obsession--an odd enough generalization in itself--that "knowledge ought to bear fruit in works, that science ought to be applicable to industry, that men ought to organize themselves as a sacred duty to improve and transform the conditions of life" (3). He writes, furthermore, that "In the first chapter of Genesis [Bacon] read that when God made man, He gave him dominion over all creatures. This, in Bacon's opinion, was what knowledge was for. He despised all knowledge that did not help restore mankind to this dominion" (3). No evidence supports such a claim, but it is the strength of such rhetoric that has bolstered the prominence of a utilitarian Baconianism. For Arthur F. Kinney, "purely empirical learning was given its best-known philosophical underpinning by Francis Bacon. . ." (9). H.B. Nisbet, writing of the relation between Bacon and Herder, suggests that "[I]n so far as Herder's ideas have any real empirical and inductive foundation . . . he makes it abundantly clear that it was chiefly to Bacon, with his *commercium mentis et rei*, that he looked as his theoretical guide, and in practice, his own nature always disposed him in favour of concrete experience and the natural world" (27).⁵⁹ An extreme interpretation along these lines--extreme because of its complete and utter failure to accurately reflect the text about which it speaks--comes from Ernst Cassirer, who writes of seventeenth-century epistemology in general, and Bacon's in particular, that

[i]t was the time which peremptorily demanded the advance from theory to action, from mere knowledge to a practical control of reality. This was the

point at which according to Bacon the goal of scholasticism departs from that of the new science, of the '*instauratio magna*'. Knowledge is to be sought only for the sake of power, and its consummation and final test lie in power alone." (45)

As Joseph A. Mazzeo has rightly pointed out, "[a]lthough Bacon had a strongly utilitarian attitude toward knowledge, he insisted that the data for his new history should be chosen essentially for whatever possibilities they seemed to have for affording new knowledge, for providing the factual base for those fresh inductions which alone can advance learning" (204). We shall notice in more detail the implications of Mazzeo's suggestion when we come to an explanation of Bacon's conception of natural history. For the moment, it is necessary that we demonstrate the degree to which the above versions of Bacon's empiricism tend to ignore the text in favour a traditional reception. We might begin with the following passage from the *Novum*, which certainly ranks among the strongest pieces of textual evidence for Bacon's putative utilitarianism. He writes:

Lastly, I would address one general admonition to all--that they consider what are the true ends of knowledge, and that they seek it not either for the pleasure of the mind, or for contention, or for superiority to others, or for profit, or fame, or power, or any of these inferior things, but for the benefit and use of life, and that they perfect and govern it in charity. (15)

Once again, we encounter a passage that has, over the course of Baconianism's history, been construed as an eminently self-evident mark of what we believe the nature of Bacon's project to be. For here, as elsewhere, Bacon has been taken to mean that his renovation is solely concerned with the betterment of the human condition--we need only look to our earlier discussion of Louis Dupré's contention--reminiscent of Farrington's above--that Bacon sought nothing more than practical knowledge for a strong exemplification of this ethos. Such an interpretation is by no means out of place

here. If it does, in the end, conflate the “true ends” of knowledge with the “benefit and use of life,” such a conflation seems entirely reasonable. And if we might point out that it is only the “seeking” after knowledge *in general* that is referred to the question of utility--the “use of life” not necessarily being construed as the “true end” of knowledge--still, it would take far stronger textual evidence for us to reverse the reading of utilitarianism that this passage seems so obviously to sanction.

Yet we must recall Bacon’s penchant for “doubling” and “iterating upon” certain crucial conceptual elements of his project, and just as his conception of nature was found to be far more complex after discovering the doubleness with which he figures it in the *Novum*, so too is it the case with the concept of utilitarianism. I point, in this regard, to a passage that occurs just moments after the passage above announces what seems to be a clearly utilitarian trajectory:

Of myself I say nothing; but in behalf of the business which is in hand I entreat men to believe that it is not an opinion to be held, but a work to be done; and to be well assured that I am laboring to lay the foundation, not of any sect or doctrine, but of human utility and power. (16)

Bacon’s project, as he conceives it, is not simply to propound upon the benefits of a utilitarian outlook--for him, the very question of laying the foundations that make utility a concern at all are at stake. We must be clear: the *foundations* of “utility” are not to be confused or conflated with utility itself--we have already seen how Bacon disqualifies the “thing” from its ability to contribute to knowledge about itself, and the question of utility is being similarly treated here. In this, our tentative reading of the first passage above--that the conflation of the “true ends” of knowledge with utility is by no means a necessary reading--is given far more credibility, for we see that these

“true ends” are meant to speak to the foundations of utility in general. We must, then, also be clear about the grounding conditions of Bacon’s critique: his treatment of the thing and utility in this manner is a necessary reflection of his polemical stance on the state of rationalist inquiry in general. Utility, just like the thing, cannot stand as a self-evident representation of itself, especially if, as Bacon demands, they are to refer in some way to the facts of nature as we have construed them above. Here then, something other than utility must be at stake for it to become an issue at all; otherwise, utility simply becomes either a reflection of the rationalism that it is meant to replace, or one more empiricism whose lack of theoretical grounding makes it incapable of contributing to “the art of discovery” itself.⁶⁰

We might, before moving on to the *Plan*, close this selective discussion of the *Preface* by looking forward to the *Novum* proper in an effort to circle back to Horton’s opening characterization of Book I as the “demolishing branch” of Bacon’s project.⁶¹ Bacon himself would have resisted Horton’s implication concerning the degree to which he “demolishes,” as we have noted above, but there is an even more important sense in which this resistance also implies the theoretical, rather than utilitarian, nature of his project. As Bacon writes:

On one point not even a doubt ought to be entertained, namely, whether I desire to pull down and destroy the philosophy and arts and sciences which are at present in use. So far from that, I am most glad to see them used, cultivated, and honored. There is no reason why the arts which are now in fashion should not continue to supply matter for disputation and ornaments for discourse, to be employed for the convenience of professors and men of business, to be, in short, like current coin, which passes among men by consent. Nay, I frankly declare that what I am introducing will be but little fitted for such purposes as these, *since it cannot be brought down to common apprehension save by effects and*

works only. . . . Meanwhile, I give instant and distinct warning that by the methods now in use neither can any great progress be made in the doctrines and contemplative part of sciences, nor can they be carried out to any magnitude of works. (116-117; my emphasis.)

What stands out here is Bacon's distinction between the project he augurs and the one that he critiques. For him, the assumptions of the latter are so profoundly incommensurable with his own as to imply that, even given the degree to which his own thought is predicated on a determined critique of those assumptions, his own project does not constitute a determined threat to them. This is an important point to make, especially given the degree to which Bacon commentary has chosen to see Bacon's relationship to his so-called adversaries as a point of contradiction in his project.⁶² But as we see here, no contradiction can exist where the very grounds for such a judgment are at issue. Bacon clearly creates a distinction between the very labour of his project and the one he critiques, one that has already been suggested in his famous formulation, "I cannot be fairly asked to abide by the decision of a tribunal which is itself on trial" (16). Circular disputation, that is to say, has its place. It is precisely in this seemingly generous gesture to that which he critiques that the theoretical nature of what he proposes emerges. Crucial here is Bacon's suggestion that what he announces as an altogether different kind of project "cannot be brought down to common apprehension save by effects and works." Effects and works, both indicators of a utilitarianism, are figured here as the *by-products* of a project whose most proper concern is, precisely, the "contemplative part of sciences." We must acknowledge, in this position, a desire to address the presuppositions of utilitarian inquiry, a trajectory that exhibits an entirely different set of epistemological stakes.

And as we have seen, it is a way of questioning, not the results of that questioning, that names those stakes, and that I would suggest to be what is most important about Bacon's scientific writings. That way of questioning must refer itself, as it does here, to progress, the mechanism by which Bacon is able to distance himself from the self-referentiality that contemporary disputation implies. Bacon will not do away with this circularity altogether, as we shall see, but he will re-shape it in ways that continue to define how it is that we engage the obscurity of nature.

Part II

The Plan

If *The Great Instauration* announces the intellectual formalism against which Bacon will place his own strategic approach to nature, the *Plan* intends to cash out in more detail what Bacon sees to be the necessary steps in articulating and deploying that strategy. Of the six "parts" of the "instauration" named by Bacon--1. The Division of the Sciences 2. The New Organon 3. The Phenomena of the Universe 4. The Ladder of the Intellect 5. The Forerunners and 6. The New Philosophy--all can be said to refer themselves, either explicitly or implicitly, to an overriding concern with the production of knowledge as elaborated by him in the opening remarks of the *Preface*. While the taxonomically oriented *Sylva Sylvarum*, the painstaking classifications of knowledge in the *De Augmentis*, or even the "Prerogative Instances" of the second book of the *Novum Organum* certainly gesture to major work done with the other constituents of Bacon's overall plan, Bacon can only truly be said to have completed the second step. Nevertheless, his discussion of those steps in the *Plan*, and their relation to the

fundamental theoretical issues concerning knowledge production that we have already raised, offer themselves as particularly illuminating exemplifications and elaborations of the reading that we have maintained so far.

In particular, Bacon spends the great part of the *Plan* discussing steps 2--“The New Organon; or Directions concerning the Interpretation of Nature”--and 3--“The Phenomena of the Universe; or a Natural and Experimental History for the Foundation of Philosophy.” In both cases, Bacon offers very detailed descriptions of the stakes that inhere in undertaking these more or less radical scientific operations, and it is precisely his articulation of those stakes, and the meaning they hold for his project in general, that makes a detailed discussion of them here of such value. It may be worth emphasizing that what Bacon undertakes here is far more than simply a description of the project he intends to offer in its various parts; he is just as concerned to place the significance of its various components in the *theoretical* light that, as I have argued so far, organizes the *Instauration* as well. We shall, then, focus our interpretive efforts on Bacon’s elaboration on parts 2 and 3 of his project.

1. The New Organon

Bacon describes the proper work of this New Organon as

the doctrine concerning the better and more perfect use of human reason in the inquisition of things, and the true helps of the understanding, that thereby (as far as the condition of mortality and humanity allows) the intellect may be raised and exalted, and made capable of overcoming the difficulties and obscurities of nature. (18-19)

The “better and more perfect use of human reason” does not simply refer to the necessity for disciplining the intellect’s approach to things, but more importantly

implies a resistance to the forms of rationalist inquiry that we have elaborated upon above. What is most telling is Bacon's introduction of the concept of a "help" *for the understanding*. Here, Bacon announces what must surely have been a truly radical reconception of the relationship between the world and the mind. For we have seen that rationalist modes of inquiry, at least for Bacon, conceived the mind as the first and final judge concerning that about which it questioned--what could possibly "help" that which, always and everywhere, remained both judge and reference point in any approach to the obscurity of nature? The very suggestion that the mind needs helps accomplishes the first step in breaching the circular reasoning that revolves around the human intellect--the mind is no longer the final judge of that which it comprehends, but must now refer, and be referred to, certain external criteria that the "helps of the understanding" figure--the "reference point" in all inquiry now lies beyond the sole purview of the mind.

Precisely what that external criteria is emerges immediately after this re-orientation in the work of the human intellect. Bacon writes:

The art which I introduce with this view (which I call "Interpretation of Nature") is a kind of logic, though the difference between it and the ordinary logic is great, indeed, immense. For the ordinary logic professes to contrive and prepare helps and guards for the understanding, as mine does; and in this one point they agree. But mine differs from it in three points especially--viz., in the end aimed at, in the order of demonstration, and in the starting point of the inquiry. (19)

Bacon once again offers a "doubled" articulation of his resistance to contemporary epistemology, for here he names two logics, the "ordinary" logic which, as we have been at pains to point out, understands its own assumptions to prescribe

what can be known (and proscribe what cannot), and the new logic--the "Interpretation of Nature"--in which the circularity of standard modes of disputation is broken, and in which nature itself becomes the new criterion in terms of which knowledge will now be judged and produced. It is necessary to turn here to a more detailed interrogation of what these three differences from the old logic herald, unpacking in turn precisely what it is that Bacon means by the "Interpretation of Nature" and its most famous constituent, induction.

Ends

Bacon's description of the "ends" of his new logic are meant primarily to recall the reflexive--in a sense self-conscious--nature of Bacon's approach to the production of knowledge. As he writes:

For the end which this science of mine proposes is the invention not of arguments but of arts; not of things in accordance with principles, but of principles themselves; not of probable reasons, but of designations and directions for works. And as the intention is different, so, accordingly, is the effect; the effect of the one being to overcome an opponent in argument, of the other to command nature in action. (19)

Of particular importance here is Bacon's use of the term "invention" in order to figure the new "ends" towards which his thought is directed. Once again, we must here recall an obsolete usage of the term, one still in use in Newton's time, in which Bacon's understanding of invention refers to both a form of "contrivance" or "devising," but just as important, "the act of coming upon or finding," and most especially, "discovery." (OED) What we see Bacon placing at stake, then, is not the question of "inventing" in terms of the creative act of the mechanic; if this meaning also inheres in Bacon's usage (as indeed it does), there can also be no question that Bacon uses the word in terms that

point to a more primal grounding of invention, to the very possibility of invention itself. “Invention” carries with it not just a mode of making, but also the presuppositions that make such “making” possible.⁶³ That is to say, it is always and everywhere *discovery*, and indeed, the discovery of discovery, that is at stake in Bacon’s use of the term.

It is for this reason that our earlier discussion of utilitarianism made the point that the “true ends” of knowledge did not only refer themselves to the “benefit and use of human life.” Here, as Bacon makes quite clear, the ends of his project refer to a form of invention *as* discovery in which “arts” themselves, and not just the things they are meant to produce, are opened to concerted inquiry--one does not, in Bacon’s model, strive for the discovery of things, but for the very principles that are productive of those discoveries. Once again, we are offered a (re)iteration of Bacon’s suggestion that the thing cannot be the primary of source of knowledge about it. That Bacon chooses furthermore to emphasize the necessity for the ends of his program to refer to the “designations and directions for works”--Bacon might well have used the chiasmus, “discovery of inventions as the invention of discovery”-- marks Bacon’s belief that a certain theoretical commitment must inhere in the work of disclosing nature, a theoretical commitment that commentators generally believe to be lacking in Bacon’s thought. As we have seen, it is not enough for Bacon for an experiment to produce results or “works”--those results must always augur more experiments and different results as well. And finally, if Bacon’s program proposes the possibility of “commanding nature in action,” we have already established that such an approach to nature depends on a certain obeisance and patience, precisely demonstrated by the

necessity for a theoretical model to be developed prior to the interrogation of things. The shift that Bacon augurs simply states that nature, rather than the mind, will now be the ownmost object of that model.

Demonstration

In turning to the question of demonstration, which is to say, its “nature and order,” Bacon makes it clear that demonstration is closely related to--indeed, productive of--the “ends” that he has just described, for as he says, the “nature and order” of demonstration should always be carried out “in accordance” with the ends of which he speaks (19). It helps in this regard to understand Bacon’s very specific understanding of the term “demonstration” itself--for him, demonstration does not simply refer to a kind of “display” for the purposes of proof, but more importantly figures the very form of rationalist inquiry that he is so concerned to critique. In this regard, demonstration must be understood to imply a show of proof undertaken by means of deductive reasoning. There was, of course, a formal mode of reasoning and “proving” that perfectly epitomized this understanding of the work of demonstration, and it is one that Bacon found most pernicious:

In accordance with this end is also the nature and order of the demonstrations. For in the ordinary logic almost all the work is spent about the syllogism. Of induction, the logicians seem hardly to have taken any serious thought, but they pass it by with a slight notice and hasten on to the formulae of disputation. I, on the contrary, reject demonstration by syllogism as acting too confusedly and letting nature slip out of its hands. (19)

For Bacon, the syllogism lets nature “slip out of its hands” precisely because of its tendency to privilege the formula of disputation over that being questioned by it--as

Bacon will say at numerous points, the syllogism's "confusion" lies with its attempt to produce knowledge that is consistent with the syllogistic form, rather than with that about which it "syllogizes." In this regard, it becomes the singularly representative form of the kind of tautological rationalist inquiry that Bacon is most concerned to critique and replace.

But this is not all that bothers Bacon about the syllogism; there are even more sinister consequences in unduly privileging its formal features as a mode of inquiry into nature:

For although no one can doubt that things which agree in a middle term agree with one another (which is a proposition of mathematical certainty), yet it leaves an opening for deception, which is this: the syllogism consists of propositions--propositions of words; and words are the token or signs of notions. Now if the very notions of the mind (which are as the soul of words and the basis of the whole structure) be improperly and overhastily abstracted from facts, vague, not sufficiently definite, faulty--in short, in many ways, the whole edifice tumbles. (19)

Here we see a remarkable example of Bacon's attempt to put the "tribunal on trial," for his critique of the syllogism is directed against its very condition of possibility: the transparent self-sameness of the terms it uses, its language. Bacon describes here an epistemological abyss, a linguistic and semantic *mise-en-abyme* that hides itself in the very structure of syllogistic reasoning. To be sure, the critique offered here would not even be recognized as a concern by the practicing rationalist of Bacon's day,⁶⁴ but for Bacon, the manner in which authoritative meaning decays the further into the syllogism one goes is a direct consequence of deductive reasoning undertaken while improperly conceiving the limits and work of the mind. It is helpful to recall here that Bacon's critique of syllogism is furthermore a concerted critique of an Aristotelian

conception of the self-evidence of language, one that would have informed in a significant way the rationalist understanding of syllogistic reasoning. Compare, for example, the passage above to the following from Aristotle's *De Interpretatione*:

Now, whatever it is [that transpires] in the creation of sound by the voice is a showing of whatever affections there may be in the soul, and the written is a showing of the sounds of the voice. Hence, just as writing is not identical among all [human beings], so too the sounds of the voice are not identical. However, that of which these [sounds and writing] are in the first place a showing are among all [human beings] the identical affections of the soul; and the matters of which these [the affections] form approximating presentations are likewise identical. (cited in Heidegger, 400-401)

We cannot underestimate how important Bacon's critique is when it is cast alongside Aristotle's discussion of speech and writing here--it is well known that Aristotle's thought was often the object of concerted critique by Bacon. We might begin by noting the sympathy between Aristotelian "showing by deduction" and the kind of "demonstration" that the syllogism is meant to figure--Aristotle's model here is, indeed, syllogistic itself, insofar as it depends on the "affections" as a sort of middle term--i.e., it is to the presentation of the affections of the soul that writing and speech are referred. But even more important in this regard is the remarkable reversal that Bacon creates in treating the relationship between word and soul--if language (as either sound or writing) is for Aristotle a transparent purveyor of the affections of the soul, for Bacon, it is the soul of the *word* whose motive efficacy is called into question precisely because of the "notions" that constitute and (con)figure it.⁶⁵ What Bacon names here is the deception of Aristotle's syllogism, the subterfuge both in and of the syllogism that replaces the word with the soul. In pointing up the limitations of the mind, as we saw

earlier, Bacon creates a breach in Aristotle's seemingly implacable logic, introducing the mediating experience of an untrustworthy mind to the syllogistic mix. Since the souls of words are constituted by a mental operation whose workings are suspect, the transparency of the word itself is rendered opaque, and inevitably, "the whole edifice tumbles."⁶⁶

Induction as Demonstration

Insofar as the self-referential model of knowledge production that represents rationalist inquiry gives rise to and is valorized by syllogism, for Bacon, it must ultimately remain "barren of works, remote from practice, and altogether unavailable to the active department of the sciences" (20). Again, I would suggest that this does not imply a empiricism so much as a marshaling point for a concerted critique of rationalist inquiry. It is precisely this marshaling point, in fact, that prompts Bacon to name the syllogism's replacement, and what he names in this regard has become the singularly most familiar, and singularly most misunderstood, of Bacon's arsenal of philosophemes:

Although, therefore, I leave to the syllogism and these famous and boasted modes of demonstration their jurisdiction over popular arts and such as are matter of opinion (in which department I leave all as it is), yet in dealing with the nature of things I use induction throughout, and that in the minor propositions as well as the major. For I consider induction to be that form of demonstration which upholds the sense, and closes with nature, and comes to the very brink of operation, if it does not actually deal with it. (20)

Once again, Bacon distances the concerns of his own project from those proper to the "modes of demonstration" represented by syllogistic inquiry, marking out a new path for the engagement of nature. Induction is the name given to that new path, and it

is here that we must consider the meaning and nature of Bacon's shift. For induction is put in place to deal with the "nature of things," not, significantly, with things themselves, since to suggest the latter would be to contradict Bacon's earlier suggestion that the thing itself is unavailable to inquiry as a source of knowledge concerning itself, its nature. In this regard, the pervasive interpretation of induction as a kind of accumulation of facts does not account for its nuanced function.⁶⁷ It is positioned against syllogism not in order to dismantle it so much as to define the spheres of epistemology where each is most efficient. It is for this reason that Bacon preserves the syllogism for pedagogical purposes. As John J. Miller writes,

"education [is] a project clearly distinct in both method and intent from scientific investigation. The inductive method of investigation is an inherently inefficient process: it resists the efficiencies offered by the "Idols" of received opinion which prematurely exclude, preclude, or edit new observations and information. It defers as long as possible the formation of coherent axioms and keeps those it does form provisional and insecure. Education, on the other hand, because it is concerned with forming a discrete self which has to exist in the real world, cannot afford such inefficiencies. Unlike induction, the aim of education is not just discovery but use" (354).

Induction, then, concerns itself with the larger grounding principles--almost an ontology--of things, and in this regard cannot be construed in the simplistic terms that have come to figure it, to wit, that induction simply names a methodological pattern of scientific behaviour in which one moves in ones questioning from the particular to the general. No such patterning is at stake in Bacon's seminal articulation of the place and purpose of induction here--it is clear that his concerns at this point are oriented towards the more theoretical conditions of inquiry. As Perez-Ramos writes, "we may assert with some confidence that with his opaque *inductio* Bacon was groping after a

characterization of the cognitive process in natural enquiries which would also account for the possibility of knowledge in general” (242).⁶⁸ In accounting for the very possibility of knowledge, then, we must pay very close attention to Bacon’s understanding of the place of induction and the manner in which it contributes to the overall rejection of rationalist modes of interrogating nature. Crucial here is the final sentence in the passage cited above: “For I consider induction to be that form of demonstration which upholds the sense, and closes with nature, and comes to the very brink of operation, if it does not actually deal with it.” What does it mean, in Bacon’s project, to “uphold the sense,” to “close with nature,” or to “come to the very brink of operation?” These are very strange figurations and have received no concerted attention despite the emphasis that the concept of induction has received as a kind of placeholder for the entirety of Bacon’s thought.⁶⁹ Yet these descriptions of induction gesture to what are the most crucial of concerns, and in determining what they mean we open up completely new realms of understanding for this most problematic of Baconian philosophemes.

We might first consider what it means to “uphold” the sense. Quite literally, Bacon means to “hold up” the sense, but specifically, to hold it *forth* in such a way as to mark in no uncertain terms its necessary contribution to the production of knowledge. It is important to remember what we have already noticed, that to make the senses a part of the inductive arrangement necessarily critiques the penchant in the modes of inquiry of Bacon’s day for treating the information of the senses in at best a cursory manner. As Bacon is at pains to point out in many places, it is in “flying” to general axioms on the

basis of “overhasty” abstractions from the information provided by the senses that makes it necessary, in the first instance, to hold forth the senses in this way. In other words, this new form of mental work that induction names will no longer exclude or de-emphasize its physical exigencies. There is, however, another important sense in which this “upholding” reinterprets the work and place of the senses. In being meant not so much to replace as to accompany the mental act in the investigation of nature, the senses themselves are opened up to the same kinds of critique that we earlier saw Bacon apply to the mind. As such, induction can be construed as a kind of buttressing of the senses, just as the senses are meant to buttress the understanding--what is created here is a back-and-forth movement between the senses and the intellect, and induction can be conceived, in part, as the name for this new dynamic relation.

To “close with nature,” then, is to imply this new understanding of the place of the senses in the investigation of nature, for in upholding the sense, we invariably uphold the world that the senses reflect. That this world is inevitably represented inadequately, even fallaciously, by the senses does not detract from the necessity for bringing the sense to bear on natural inquiry, since for Bacon, if the senses fail to represent nature accurately, a disembodied mental act with no reference to the world at all must be worse still. Before this comes to sound like an empiricism, however, we must recall that it is induction--the dynamic relation between sense and mind--that is closing with nature; in this regard, induction is, first and foremost, the *theoretical* “help” to the mind and sense, and as such reconceives the kind of work that they can be called on to perform.

It is this final point--that induction is introduced as a kind of theoretical help to the dynamic relation between sense and mind--that offers us insight into the most puzzling, but perhaps most important feature of Bacon's conception of induction. Bacon's suggestion that induction comes to the "brink" of operation is puzzling because, in pausing at this strange threshold, we must be given to question the prevalence of a utilitarian reading of Bacon's thought. We might recall that around Bacon's time, and in the context of the investigation of nature, "operation" took on the meaning of "the performance of something of a practical or mechanical nature, i.e., a scientific experiment or demonstration" (OED), such that Bacon's pause at this threshold suggests that induction must not be thought to conflate with a purely mechanical or even experimental relationship to nature--it must stand outside experiment in order that it may serve as its philosophical/theoretical guide. What we must also recognize here is that if, indeed, Bacon seeks to overthrow a form of demonstration that, as we saw earlier, is "altogether unavailable to the active department of the sciences," he is nevertheless very careful not to conflate induction *with* this "active department of the sciences." Much seems to be at stake, then, in suggesting that induction operates at the brink, the very threshold, of active operation--the most important of those stakes suggests that if induction is meant to close with nature, it nevertheless is not meant to degenerate into a pure empiricism. Strangely enough, Bacon does then conserve a certain rationalism in his thought (as he said he would), but it is a function for rationalism unlike anything with which his intellectual milieu would have been familiar. For if it is true that Bacon sought a "marriage"

between rationalism and empiricism, their respective vows are consecrated here, on the very threshold between speculation and operation, where induction most properly finds its place.

It is in this context that we must place Bacon's famous experimental stipulation--the stipulation with which induction has been *conflated*, unfortuitously, for the last four hundred years--concerning a new ordering of knowledge production as it obtains in philosophical demonstration. Bacon immediately goes on to suggest that, now, the tendency to "fly at once from the sense and particulars up to the most general propositions" must be replaced by a more patient consideration of precisely those particulars, proceeding "regularly and gradually from one axiom to another, so that the most general are not reached till the last" (20). We must notice here that in no way does this new model recommend itself to a pure empiricism, at least insofar as it is the question of well-ordered "axioms," and not the simply construed disclosure of the "thing," that is at stake here. Only in so understanding the "movement" of induction--the dynamism that it represents--can a call for this more patient method of inquiry remain consistent with Bacon's broader suggestion that discovery enhance the art of discovery itself.⁷⁰

Starting Point

So far, Bacon has been discussing, in order, the third--"ends"--and second--"demonstration"--stages of his Interpretation of Nature, and there is a very specific reason why Bacon delays until now the discussion of the "starting" point. In a sense, for Bacon, the end must ground the beginning, since it is only in understanding that

discovery itself, and not merely the “thing,” is the proper object of induction that one can “begin the inquiry nearer the source” (21) without invoking the kind of empiricism that he rejects. But this ordering speaks also to the philosophical decisions that Bacon has already made. For if Bacon speaks of this desire to begin “nearer the source,” it is, above all, for the purpose of “submitting to examination those things which the common logic takes on trust” (21). And obviously enough, it has been precisely the question of what this common logic is that has preoccupied Bacon’s thinking in the first half of the *Instauration* (i.e. the *Preface*.) By beginning with the end, and ending with the beginning, Bacon refers his discussion of the Interpretation of Nature to the concerns and contexts that have dominated his reorganization of scientific inquiry up to this point. In other words, in order for us to arrive at the epistemological check points that the “ends” and “demonstration” represent to and for Bacon’s project, it is necessary, in Bacon’s eyes, to begin this process by *renovating* the assumptions that ground the “common logic,” and there are, as he notes, three assumptions in particular that are worthy of concerted attention:

i. First, as Bacon writes, “the logicians borrow the principles of each science from the science itself” (21). We have already seen Bacon critique this self-referential penchant in rationalist inquiry. Until now, it has been Bacon’s primary intent simply to name it, exemplify it, point it out. It is not until this point that Bacon explicitly articulates what must be done about it: “Now upon this first point, I hold that true logic ought to enter the several provinces of science armed with a higher authority than belongs to the principles of those sciences themselves, and ought to call those putative principles to

account until they are fully established” (21). Bacon replaces the common logic with a new logic--the “true” logic--whose interrogative efficacy must be derived from beyond the particular set of assumptions that govern the particular question at hand. In other words, this replacement is Bacon’s explicit attempt to breach the self-referentiality of rationalist inquiry in general, and the syllogism in specific, by referring inquiry to a set of more general assumptions external to the localized presuppositions of a particular mode or goal of research. Here again, the ordering of Bacon’s argument concerning the Interpretation of Nature is important, for in having discussed both “ends” and “demonstration” already, it is clear to us that this “higher authority” to which Bacon refers all forms of natural inquiry has already been named and elaborated. That higher authority is induction itself.

ii. The second problem with the common logic, as Bacon sees it, concerns the degree to which the logicians of Bacon’s day “hold in reverence the first notions of the mind” (21). This point is closely connected to the question of the place of theoretical presupposition, and marks, in fact, the source of the self-referentiality seen above. We have already seen Bacon’s distrust of the mind, and it is this distrust that prompts Bacon to suggest that “with regard to the first notions of the intellect, there is not one of the impressions taken by the intellect when left to go its own way, but I hold it as suspect and no way established until it has submitted to a new trial and a fresh judgment has been thereupon pronounced” (21). Again, it is only in understanding that induction forms the new tribunal before which the “impressions of the intellect” will be tried that the possibility of convening a “new trial” arises at all.

iii. Finally, just as the logicians tend to take the first judgments of the mind at face value, so too do they likewise treat the information of the senses, “receiv[ing] as conclusive the immediate information of the sense, when well disposed” (21). And, just as Bacon finds the starting point of the “true logic” in a critique of the place of mind in the production of knowledge, so too does that starting point depend on a concerted critique of the senses as well: “And lastly, the information of the sense itself I sift and examine in many ways. For certain it is that the senses deceive; but then at the same time they supply the means of discovering their own errors; only the errors are here, the means of discovery are to seek” (21). We shall return in a moment to the meaning of this final configuration of the senses--as that which at once deceives while providing the means of discovery of their deception.

Now, in light of these three points of critique, we can say that Bacon’s attempt to “begin the inquiry nearer the source” does not simply suggest that he means to begin “closer” to nature. It seems, rather, that this source is to be construed as the very set of assumptions we hold concerning our interrogation of nature, and the capacity--indeed, necessity--for self-reflection as Bacon understands it here cannot be stressed enough. It is reflection upon the constitutive elements of the knowledge we produce about the natural world--our theories, our minds, our bodies, and the vagaries that possess all three--that Bacon names to be the new starting point of our inquiry in to nature. And we can say, at this preliminary stage, that induction, the “method of demonstration” meant to purvey this new source of knowledge, must by necessity be far more than a formal mode of inquiry (i.e., a metaphor for the movement of inquiry from the particular to the

general). It is because, in large part, that we must reflect upon the physical and mental (*empirical and rational*) exigencies of inquiry itself that induction comes into being. Induction is, in other words, a reflection of a reflection, *a reflection of reflection*, insofar as induction reflects, as it were, the (self)reflection that names the source of Bacon's inquiry.

What I offer here are more, I think, than just rhetorical flourishes on my part. After naming these three constituents of the "Baconian starting point," Bacon has cause to discuss in greater detail the question of the senses and the question of mind, and the only reason that he does not discuss in greater detail the manner in which "logicians borrow the principles of each science from the science itself" is because he has already done so at great length in the *Preface*. Now, the question of body and mind, particularly as pertains to the question of the place of the senses in Bacon's program, is given in no uncertain terms to reflection, as his continuing discussion demonstrates.

The Senses

The fundamental problem with the senses, as Bacon sees it, is their inability to offer accurate information of the world with which they interact. This is nothing new to Bacon studies. What is often forgotten, however, are both the reasons why Bacon chooses to read the senses in this way, and more importantly, the remarkable implications that arise therefrom, implications that have to do directly with the meaning and function of induction and experiment in the Interpretation of Nature. In other words, what we must understand here is the manner in which Bacon conceives the senses to offer themselves to the same kind of self-conscious reflection that we earlier

saw with the mind, and it is in this regard that Bacon's suggestion that the senses can at once deceive even as they disclose the deception makes the most sense in terms of the theoretical mien of his project. Bacon makes the crucial point, for example, that the senses are not simply flawed in terms of their tendency to "fail" us by offering no information due to their lack of precision. Just as important for Bacon is the attempt to understand how it is that they can give false information, and in treating this problem Bacon produces a profoundly self-conscious mode of thinking: "For the testimony and information of the sense has reference always to man, not to the universe; and it is a great error to assert that the sense is the measure of things" (21).

What Copernicus does for astronomy, Bacon does for the philosophy of science (and perhaps indeed for philosophy itself)--"man" is displaced as the first and final reference point in both the production and judgment of knowledge. It is worth noting how Bacon uses the structure of the syllogism itself to demonstrate how the syllogism, and by extension its philosophical grounding in rationalist thought, must inevitably fail in the task to disclose the secrets of nature, and this precisely because of its belief in the priority of man in the production of knowledge. For as we see, if the sense has reference only to man, and it is an "error to assert that the sense is the measure of things," then man himself must be disqualified as the *final* judge of the knowledge--the things--he produces. Bacon certainly does not disqualify "man" from a crucial role in knowledge production, as we shall see in a moment, but in offering a more self-conscious approach to the place of the human in the disclosure of nature, he calls into question the kind of inquiry whose deferral to the limitations of human reason is

precisely responsible for its lack of self-reflection, its inability to think its own position vis-à-vis natural inquiry.

In What Sense, Experiment?

It would seem, then, to be Bacon's task in dealing with the sense to replace the rationalist model with one that at once resists the urge to privilege human judgment above all else--precisely by incorporating mechanisms against this tendency--while at the same time preserving an element of the human that speaks to its crucial presence in the production of knowledge. Bacon must somehow come up with a model of research that imagines this subtle shift not only in the trajectory of human inquiry, but in the very place of the human itself. What gets preserved, as a result, is precisely the ability of man to reflect upon his own place in the production of knowledge--that about humanity which is perhaps most human. Bacon figures the means of this preservation in a most remarkable way:

To meet these difficulties, I have sought on all sides diligently and faithfully to provide helps for the sense--substitutions to supply its failures, rectifications to correct its errors; and this I endeavour to accomplish not so much by instruments as by experiments. For the subtlety of experiments is far greater than that of the sense itself, even when assisted by exquisite instruments--such experiments, I mean, *as are skillfully and artificially devised for the express purpose of determining the point in question*. To the immediate and proper perception of the sense, therefore, I do not give much weight; *but I contrive that the office of the sense shall be only to judge of the experiment, and that the experiment itself shall judge of the thing.* (22)

Bacon's comments here mark a decisive philosophical moment for his program. For first of all, the very question of what constitutes a "help" for the sense is construed in theoretical, not empirical terms; it is not an "instrument" that most properly represents

the kind of “help” about which Bacon speaks, and any suggestion that Bacon might construe “helps” in empirical terms is cast in doubt when he suggests that the “subtlety” of *experiments* is greater than the sense, even when “assisted by exquisite instruments.” Clearly, Bacon is meaning something here that is altogether unfamiliar to the usual manner in which the Baconian “help” is construed by contemporary commentary.⁷¹ The “assistance” at stake, in other words, has nothing at all to do with honing the abilities and attributes of the sense. And this must be the case, for in theorizing the relationship between the sense, the instrument, and the experiment, Bacon is asking a question that still resonates to the very core of scientific practice. How, precisely, does one improve the efficacy and/or accuracy of the sense--of the very ability to register/observe phenomena in general--without having a clear understanding of the stakes of doing so? The sense, in being able to be “improved” by exquisite instruments, shows itself simply to be an instrument itself, and as such just a single--and not even the most important--constituent of a more broadly conceived approach to the obscurity of nature. To rest here, in improving the senses, is to become nothing more than the mechanic, whose discoveries, interesting and useful as they might be, can never offer anything beyond themselves, can never offer insight into discovery itself. In naming the “experiment” as a more suitable “help” for the senses, Bacon names the driving force behind any formal mode of research whatsoever. Specifically, Bacon means experiment in this context to disclose, not the answer to a question, *but the question itself*, experiments devised, that is, “for the express purpose of *determining the point in question*.” We must recognize that the senses, for Bacon, are made more accurate and efficacious--are better able to

disclose their own deceptions--when they are guided by decisive questions, not "exquisite instruments." The prosthetic configuration of the relationship between scientist, experiment, and thing, reflects this profoundly theoretical moment, and once and for all forces the breach in the circle of reasoning endemic to the logicians. We might recall, for example, the syllogism with which Bacon began his critique of the senses, wherein was implied the view of Bacon's contemporaries in which the senses became the "middle term" between thing and man. Bacon's play on that syllogism leads directly to his statement concerning experiment here that could only be construed as a strangely "asyllogistic" construct: "but I contrive that the office of the sense shall be only to judge of the experiment, and that the experiment itself shall judge of the thing." I say that this final passage is *asyllogistic* because even as resonates with the same kind of tripartite structure that marks the syllogism's formal features, its terms are no longer interchangeable--the sense can judge the experiment, and the experiment can judge the thing, but for Bacon, it clearly does not follow that the sense can judge of the thing; the sense can never be a middle term, and in losing its place, turns experiment itself into something altogether unfamiliar, insofar as it seems to become anthropomorphized, takes on a life of its own. What results is a prosthetic conception of experiment that, nevertheless, does not interpret prosthesis itself in the usual way. For what "enhances" sense is not, properly speaking, a "thing," or a technology, at all, but rather a sensitivity to a form or manner of questioning. That manner of questioning privileges, precisely, the question itself, *the question of the question*,⁷² as not just a constituent, but also an *object*, of inquiry. In this determination, experiment is seen to be entirely consistent

with Bacon's earlier suggestion that the thing itself is no longer the proper source of knowledge concerning it, and the conception of experiment presented here emphasizes what it is we must turn to--i.e., the question itself--in lieu of the thing's lack of availability to objectively construed knowledge. We should recall, at this point, a moment from the *Preface*, in which the lack of access to the thing itself necessitated a new figuration, and configuration, of the concept of experiment:

For no man can rightly and successfully investigate the nature of anything in the thing itself; let him vary his experiments as laboriously as he will, he never comes to a resting-place, but still finds something to seek beyond. And there is another thing to be remembered--namely, that all industry in experimenting has begun with proposing to itself certain definite works to be accomplished, and has pursued them with premature and unseasonable eagerness; it has sought, I say, experiments of fruit, not experiments of light, not imitating divine procedure, which in its first days work created light only and assigned to it one entire day, *on which it produced no material work*, but proceeded to that on the days following. (11-12)

Of importance here is the clear suggestion that the experiment, as such, cannot be simply or directly marshaled for the "benefit and use of life" as is generally conceived. In turning from the thing and toward the question, we see here how the figure of "light" bolsters Bacon's later suggestion that the experiment puts the question itself, and not the thing under study, in question.

An important rhetorical moment emerges from Bacon's discussion of experiment here, and it speaks back to Bacon's earlier concern with the efficacy, or lack thereof, of circular modes of disputation. In realigning the place of sense and the concept of experiment, Bacon conceives himself to "perform the office of a true priest of the sense. . .and a not unskillful interpreter of its oracles" (22); and that while others

“only profess to uphold and cultivate the sense, I do so in fact.” Two rather important points emerge here. The first refers itself to the question of where, in conducting our inquiry into nature, our “oracles” must lie. As we saw earlier, the logicians oracles were purely constructs of mind, and as such, opened themselves to reproducing the assumptions and conditions under which they were brought into being. The Baconian oracle is different in that, in the first instance, it originates with the sense and not with the mind. In this regard, it is Bacon’s insight to come to privilege the necessity for *interpreting*, rather than taking for granted, the oracles of the sense. Again, the senses are serving here as a means of breaching the self-referentiality of rationalist “oracles.”

A second and equally crucial point concerns the manner in which induction itself is implied as the interpretive model to be used in the priestly articulation of these oracles. For Bacon reminds us that, if a newly construed place of the sense in natural inquiry should refer in crucial ways to the very questions towards which the senses will be directed, and according to which their information will be interpreted, it is, precisely, induction that grounds this new conception, an induction conceived according to the theoretical goals that we saw Bacon articulate earlier. Indeed, in repeating that he will “uphold and cultivate the sense” against the backdrop of this new orientation for the senses (i.e., towards the question), the theoretical implications of induction itself are brought to bear. In saying that he will uphold and cultivate the sense in fact, our earlier discussion of fact tells us that Bacon truly means to do so *in theory*.

Part II. Natural History

Bacon, having discussed the theoretical presuppositions that ground the primary constituents--especially experiment and induction--of his Interpretation of Nature, is now in a position to discuss "Step 3" of his project, the collection of natural histories. This stage of Bacon's project, and its relationship to the Interpretation of Nature, remains profoundly misunderstood. One usually finds it described as "an initial reservoir of substantially unorganized facts. . .based on observations and experiments" (72).⁷³ In fact, Bacon saw it to be intelligible to his program of epistemological reform only insofar as it could reflect the strict theoretical presuppositions that grounded his new conception of scientific inquiry. It is in this light that we now discuss Bacon's concept of natural history.

1. The Material of Knowledge

If the work of science is to be undertaken according to a new model, one that rejects the circularity of rationalist inquiry, the very nature upon which one works must similarly be re-theorized, and it is this task that orients Bacon's discussion of the "Phenomena of the Universe." Bacon's elaboration of a newly conceived natural history is perhaps the most compelling evidence of his attempt to make the senses themselves an object of the kind of self-conscious questioning that we witnessed above, insofar as a faulty natural history (and just what this is we shall see in a moment) contributes directly to the vagaries of the senses, "sometimes failing, sometimes false." Natural history, when properly conceived, can also serve to enhance the senses by providing them with what Bacon will come to emphasize as a more properly prepared configuration of raw material with which to work.

What is most crucial for us, however, is to unpack precisely what a “properly prepared” natural history meant for Bacon. As far as Bacon was concerned, attempts to disclose the workings of nature failed not simply because of the problems of the mind or the senses, but also because these rational and empirical faculties had produced a natural history--that is, a version or view of the world itself--that was hopelessly flawed. If, then, Bacon takes great pains to redress and expose the various assumptions that ground an improper conception of the senses and the mind, so too does he emphasize the need to repair the epistemological by-product of these failings. For indeed, “a good method of demonstration or form of interpreting nature may keep the mind from going astray or stumbling, but it is not any excellence of method that can supply it with the material of knowledge” (23).

It is the question of the “material of knowledge,” and precisely how it must be approached, that concerns Bacon’s discussion of the third part of his program. As Bacon sees it, natural history is largely “trivial and poor” (24), and in the first instance starts experimental research off on the wrong foot. Rationalist means of putting such natural history to use only compound the problem, for they “attempt to mend the matter by a preposterous subtlety or winnowing of argument” (24), a manner of reasoning clearly exemplified by the syllogism. And yet, the problem here is not simply that such an attempt to disclose nature is preposterously subtle or winnowing; above all, such an approach is strangely, and always, *belated*, precisely because it comes *too soon* in the order of knowledge production. Put another way, in ignoring the sheer lack or triviality of the material knowledge at hand, the rationalist too quickly proceeds to general

assumptions. This premature leap makes it, *a fortiori*, too late to repair the damage that has been done to the question at stake.

Out of this doubly fraught situation Bacon suggests that a “reconstruction of the sciences” is in order. The foundations for this reconstruction cannot be laid down simply on the material knowledge that Bacon says is lacking in the first instance. This new natural history must, above all, be “gathered on a new principle” (24). What this augurs is more than simply a shift in the nature of what it is possible to gather within the scope of this newly conceived material of knowledge, though inevitably, this is implied. What is of most significance here, however, is the fact that natural history--material knowledge--is itself reconceived according to the theoretical presuppositions that govern the method that will deal with it. In other words, even as the scope of what constitutes “material knowledge” broadens as the manner of inquiry itself “closes with nature,” material knowledge *itself*, as a governing concern for that upon which induction will be brought to bear, must also be reconsidered. For this new natural history, gathered as it is on a new principle, not just anything--any *thing*-- will do.

2. The New Principle

For Bacon, then, “it is vain that you polish the mirror if there are no images to be reflected” (24). In other words, a method of knowledge production remains useless without the raw material necessary to put it to work. What is just as important to Bacon in this regard however, is that such raw material cannot be entirely “raw”--as he says, “it is as necessary that the intellect should be supplied with fit matter to work upon, as with safeguards to guide its workings” (24). If the “new organon” names the safeguards

to the work of the intellect, it is this natural history that will name and explain precisely what “fit” matter is, how it is collected, and how it speaks to the theoretical presuppositions of Bacon’s project as a whole.

Bacon’s elaboration of fit matter depends on distinguishing his version of natural history from that currently in use, and names five criteria against which he distinguishes his thought from the logicians: 1) End and Office; 2) Mass and Composition; 3) Subtlety; 4) Selection; 5) Setting Forth. We shall treat each one of these in detail, but it should first be understood that much will depend, in the reading that follows, on the context that has been established by Bacon’s discussion of the *New Organon*--it is for good reason that Bacon discusses it first, even though in practice it would follow the work of natural history. For the point must be made that , in speaking about natural history, we are speaking about a field and form of knowledge-gathering that Bacon believed to be the foundation of his overhaul of the natural sciences. This natural history, in being “of a new kind,” and “gathered on a new principle,” forces us to think its relationship to and dependence upon the philosophical decisions that precede and condition it.

A. Ends and Office

For Bacon, the purpose of natural history is “not so much to delight with variety of matter or to help with present use of experiments as to give light to the discovery of axioms and supply suckling philosophy with its first food” (24). Bacon’s conception of a natural history--the material of knowledge--is not intended for a materiality at all, but for giving “light” to inquiry. The figure of light, as we recall, was used by Bacon to

reorient the very nature of experimental practice, away from utility and towards, as we have said, theory. So it is no great leap to suggest here that Bacon's new conception of natural history is similarly reoriented, away from the necessity for producing experimental "fruit," and towards a more theoretically concerned trajectory. One of the crucial arguments *against* the construction of Bacon as a utilitarian thinker arises directly out of understanding this new function for the "material of knowledge." As Bacon continues after the passage cited above, "For though it be true that I am principally in pursuit of works and the active department of sciences, yet I wait for harvest-time and do not attempt to mow the moss or to reap green corn. For I well know that axioms *once rightly discovered* will carry whole troops of works along with them" (24-25; my emph.). What looks at first to be evidence of Bacon's emphasis on the utility and benefits to "man" of science in fact belies such a reading. For if indeed Bacon pursues "works" and "the active department of the sciences," he nevertheless does so *in a certain way*, one that is incommensurable with a purely utilitarian reading--one, indeed, that seems more to concern itself with the theoretical conditions of possibility of utilitarianism itself. What we might notice, in this regard, is Bacon's emphasis on "rightly discovered" axioms, those that, in other words, reflect the imperative to give *light* to both nature and the understanding, rather than aim merely to produce more "fruit," that is, more discoveries that, while interesting and useful in and of themselves, can offer no insight into discovery *itself*.

A "rightly discovered" axiom, therefore, must be discovered according to a logic that is articulated against the intellectual practices of his day. What seems to

happen when scholars take hold of Bacon's statements is that this context is lost, and rather than seeing Bacon's "pursuit of works" as a resistance to the circular disputation of the dialectici of his day, construe it rather as the bold articulation of a utilitarianism. Yet the former need not imply the latter--while such a conflation can be perfectly correct, it is, at the same time, a conflation that conceals more than it reveals of Bacon's thought. It conceals, for example, Bacon's felt need to articulate the very theoretical grounds that would lend efficacy to his rejection of the syllogism as a valid tool for the disclosure of nature.⁷⁴ In this, the entire question of utility, while important to Bacon, must be subordinated to the question of its conditions of possibility, a situation that causes Bacon at many points (though they remain largely ignored) to stress the distinction between the utility for which he strives, and the theoretical trajectory that makes it possible.

The "end and office" of Bacon's natural history, then, while susceptible of being construed as a kind of utilitarian resistance to the ethereal speculation of the rationalist, must not be hypostatized as such, as has so pervasively become the case. The nature of Bacon's new conception of the "material of knowledge" is such that it must speak and respond to a theoretical model of inquiry--usually figured in terms of the distinction between the "light of the understanding" and the "fruit of works"--that precedes and conditions it.

B. Mass and Composition

By “mass and composition,” Bacon means his natural history to reflect not only a nature at work according to its own movements, but also a nature put under pressure by human experimental means:

I mean it to be a history not only of nature free and at large (when she is left to her own course and does her work her own way)--such as that of the heavenly bodies, meteors, earth and sea, minerals, plants, animals--but much more of nature under constraint and vexed; that is to say, when by art and the hand of man she is forced out of her natural state, and squeezed and molded. (25)

Bacon’s words here are often used to pejoratively judge his project, representing for many the violence of Bacon’s approach to nature.⁷⁵ We should remember, however, that what has been the major focus of the Plan so far has been the development and disciplining of the mind and senses in order that they may more accurately, and with greater theoretical self-consciousness, engage those questions necessary to the production of scientific knowledge. In this regard, Bacon’s rhetoric of constraint speaks not only to a certain violence that is too casually diagnosed as one of the fundamental problems with his project, but perhaps speaks just as properly to the very nature of experimental science as such. Bacon says that, since nature “betrays itself more readily under the vexations of art,” he means then “to set down at length all experiments of the mechanical arts, of the operative part of the liberal arts. . .so far as I have been able to examine them and as they conduce to the end in view” (25). The “end in view,” as we have seen, is not to commit acts of experimental violence upon nature, as is so often, and so reductively, conceived. Rather, it is precisely in order that we “give light to the discovery of causes” that we undertake this program of reform for the sake of both experiment in general, and the natural history that constitutes its object.

I do not make these points in order to defend Bacon's figuring of nature here; taken on its own, the passage is damning evidence of a certain violence towards nature that, as many rightly claim, persists today in many scientific and technological practices. What we must remember, however, is that one instance of a certain position concerning nature in Bacon's text by no means represents a definitive conception of it, and does not at all reflect the complexity of Bacon's philosophical stance. In this instance, Bacon certainly makes the explicit claim that "the nature of things betrays itself more readily under vexations of art than in its natural freedom." But as we have already seen, Bacon clearly suggests that the nature of the thing cannot be determined by simply studying, or experimenting upon, the thing itself. What can this clear contradiction imply?

There is one particularly compelling explanation for this contradiction, and it has more to do with the limitations of our own preconceptions than it does with Bacon's text. Bacon makes it clear that the experiments he hopes to catalogue pertain to the "end in view" of his natural history. As we demonstrated, this end is most properly concerned with the articulation of a *reflexive structure of scientific questioning*, one in which each experimental discovery refers, above all, to discovery itself, over against any material use it may also bear along with it. This implies a rather startling reversal of the long-held belief that Bacon's desire to "constrain and vex nature" most properly figures an aggressive and violent approach to nature. In order for nature to be approached in this manner and still faithfully reflect the philosophical decisions that have already demanded that the discovery of discovery remain ever before us in our

investigations--in order that natural history remain true to the "new principle" according to which it must now be gathered; if, that is, we are to constrain and vex nature while at the same time recognizing that the thing itself cannot be the ultimate source of knowledge in such investigations, then the very intellectual practices of the human investigator must first be "squeezed and molded" according to a new set of assumptions. In other words, if we seek to constrain and vex nature, we must first constrain and vex *ourselves* according to the very methodological edicts that Bacon's new conceptions of induction and experiment imply. The nature of things, in this regard, "betrays itself more readily under the vexations of art" only because it is this art that, in the first instance, constrains and vexes--thereby betraying the nature of--natural inquiry itself.⁷⁶

In this reading, certain facets of the passage we first cited are rendered conspicuous both for what they say and do not say. For instance, it seems strange that if the nature of things are to be revealed by the scientist's manipulations, the things themselves are not meant to be manipulated, or even susceptible of manipulation. Heavenly bodies and meteors are, to be sure, beyond the scientist's direct empirical contact, yet strangely, earth and sea, mineral, plants and animals are *also* left, in Bacon's configuration, to run their own course. What is most telling here is Bacon's grouping of heavenly and sublunary "things" according to a single epistemological stance--a truly radical move for his day. In recognizing the move that Bacon makes here, we discover that the very things that we assume would constitute the proper

objects of this “vexing” and “constraining” are very pointedly left beyond the purview of these operations; they are left “free and at large.”

What follows from the recognition of this crucial point is the realization that a “thing” of nature must never be conflated or construed as perfectly coeval with nature. In attending closely to the text, we discover, indeed, that it is *nature itself* that is “forced out of her natural state,” and the tendency that we have to conflate “things” with nature as such creates the contradiction with which I began. In other words, the violence that we attribute to Bacon’s engagement with nature is more a symptom of our lack of attention to the details of his text than it is a constituent of it, at least in this case. What is significant here, however, is the rhetorical manoeuvring necessary to make nature--the nature of nature--susceptible of inquiry even as the very things of nature remain beyond the possibility of such interrogation. What Bacon attempts to do, using the rhetoric of constraint and vexation, is to render nature *unnatural*, “forced out of her natural state,” precisely in order that nature may be opened to the “end in view” of natural history, opened, that is, to the question of theory, and the question of the question.

Most important of all, however, is the orientation and directionality that Bacon ascribes to this putative vexation and constraint. He writes:

Nay (to say the plain truth), I do in fact (low and vulgar as men may think it) count more upon this part both for helps and safeguards than upon the other, seeing that the nature of things betrays itself more readily under the vexations of art than in its natural freedom. (25)

Crucial here is the fact that vexing and constraining nature is not undertaken for the purpose of producing scientific results; at stake, rather, is the creation of the “helps and

safeguards” that Bacon persistently suggests are necessary in order that experiment--undertaken, of course, according to a new theoretical model--can maintain the efficacy of the newly articulated philosophical decisions concerning the work of the scientist and the disclosure of nature. We must remember, at this point, the new conception of “help” that arose earlier out of our close attention to the text. A “help,” as we recall, cannot be conceived simply as a kind of instrumental addition to the senses--if there is still a sense of prosthetic enhancement, it remains entirely theoretical, suggesting that the best aid to the sense is not to enhance their abilities so much as to ask the kinds of questions that limit their negative effects on the intellect. Of absolutely singular importance here is the notion that “constraining” and “vexing” nature is undertaken in order to provide “helps and safeguards,” *not* in order to somehow beat nature into submission, which, while remaining the dominant reading of this particular moment in Bacon’s text, is nowhere in evidence here. To constrain and vex nature is truly, then, to constrain and vex the human investigator, to name the theoretical conditions under which humanity will attempt to disclose the secrets, not the things, but of nature--to constrain and vex nature is, in the first instance and above all, self-reflection.

We might say that it is precisely this conception of the place and meaning of Bacon’s metaphors of vexation and constraint that allows the material of knowledge, “gathered on a new principle,” to surpass and exceed the limitations of natural history as a simply conceived “history of bodies.” Indeed, Bacon broadens its scope to include the metaphors used to describe such bodies: “I have thought it my duty besides to make a separate history of such virtues as may be considered cardinal in nature. I mean those

original passions or desires of matter which constitute the primary elements of nature; such as dense and rare, hot and cold, solid and fluid, heavy and light, and several others” (25). Bacon here places within the purview of questioning the very metaphors whose function is seemingly self-evident in the investigation of nature; such metaphors, constituting the very criteria by which we judge the phenomena of the world, do not, before Bacon, avail themselves of the same kind of critical treatment.

This is a telling move for two reasons. First, it clearly points to the manner in which the certain self-reflection of his theorizing is transcribed upon this natural history, since not only method, but the material to which that method is applied, is open to question; what was once the criteria one used to “judge” the phenomena of nature now becomes “judgable” itself, and thus subject to the same kinds of questions, experiments, and critique. Just as crucial here, however, is the shift in the epistemological stakes of the investigation of nature. To re-figure the criteria of knowledge as the *material* of knowledge--“. . .to make a separate *history* of such virtues. . .”--is to mark, I would suggest, the luxation between natural things and the nature to which they belong, a luxation that characterizes in no uncertain terms the “end” to which Bacon directs this natural history. It is precisely by means of broadening the scope of that which can be interrogated according to an new conception of the material of knowledge that the newly conceived trajectory of experiment becomes so important here. For no longer do we simply attempt to disclose the thing itself--we try to determine *the point in question*, and it is for this reason that the

“virtues,” “passions,” and “desires” of matter can themselves become objects of knowledge.

C. Subtlety

In trying to determine the point in question, the nature of experiment itself must change, as we have already implied in our discussion of the Interpretation of Nature.

What specifically draws our attention here is the fact that an experiment cannot hope to determine the stakes of an interrogation if it is simply arrived at by accident.⁷⁷ In this regard, Bacon’s natural history

drag[s] into light many things which no one who was not proceeding by a regular and certain way to the discovery of causes would have thought of inquiring after, being indeed in themselves of no great use; which shows that they were not sought for on their own account, but having just the same relation to things and works which the letters of the alphabet have to speech and words--which, though in themselves useless, are the elements of which all discourse is made up (25-26)

We notice, yet again, another instance of the resistance of Bacon’s text to the utilitarian readings to which it has so pervasively become subject. Just as crucial, however, is the shift in the epistemological function of experiment that follows upon this resistance. The experiments that Bacon seeks to collect as part of his natural history are not compelled to be convincing or even internally coherent; this latter criterion was a fundamental constituent of experiment as the thinkers of Bacon’s day conceived it, in which the necessity of this internal coherence at once valorized, and was valorized by, the belief that an experiment need be productive and useful in order to be an experiment at all. Under Bacon’s model, the rejection of the utility imperative allows for an increased subtlety in the function and direction of experiment while at the same time

conforming to the “goal” that Bacon sets for it: not that it produces results, but rather, that it produce more experiments.

Now, Bacon uses an interesting analogy in the latter part of the passage above to figure this new concept of experiment. Here, the subtle and “useless” experiment is to utility (things and works) what disembodied letters are to the words they constitute. This is, I would suggest, a further attempt to theorize, before the fact, utility itself, a kind of theorization that draws us back once again to the “end” that orients, in the first instance, his natural history.

D. Selection

When Bacon comes to discuss the manner of his “selection” of those experiments to be included in his natural history, we encounter another passage in his text that has been taken to figure Bacon’s thought as a burgeoning empiricism, one meant to be entirely consistent with the utilitarianism associated with his thought. Bacon says that, in providing this newly conceived platform for the material of knowledge, he is

a more cautious purveyor than those who have hitherto dealt with natural history. For I admit nothing but on the faith of eyes, or at least of careful and severe examination, so that nothing is exaggerated for wonder’s sake, but what I state is sound and without mixture of fables or vanity.
(26)

There is a tendency to ignore all but what seems most conspicuous in this passage, that is, what seems to be Bacon’s “see it to believe it” ethos. Given that Bacon speaks directly to the various problems that plague both the knowledge-gathering and knowledge-producing practices of his day--the pervasive presence of the fabulous and superstitious, the lack of credibility that, in Bacon’s eyes, dogged so much of the

natural history of his time--this ethos seems entirely understandable, or at least it makes a great deal of sense (*to us*). And if, further, we read Bacon as the progenitor of utilitarian approaches to science and nature, then such a reading of Bacon's empiricism is so obvious that to suggest a reading that surpasses and exceeds such empiricism might seem to suggest an error in method.

The problem with this reading of Bacon's project, and this passage in particular, is that the "see it to believe it" ethos runs directly counter to the explicitly stated presuppositions of Bacon's program. As we saw earlier, it was precisely the penchant for accepting knowledge on the faith of the senses that Bacon was most concerned to correct, and in this regard, empiricism as such was placed in question. How, then, are we to reconcile what seems to be yet another contradiction?

At least two ways to reconcile--or indeed, entirely debunk--this contradiction present themselves within the purview of the passage we cited above. The first has to do with understanding the context in which Bacon makes this statement. This natural history, we must remember, is meant to collect together the "material of knowledge;" we must be clear that the material of knowledge does not refer, in its essence, to knowledge of nature as such. For Bacon, the natural history is nothing more, and nothing less, than that upon which the presuppositions of his new approach to knowledge production will exert themselves. If we receive the material of knowledge "on the faith of eyes," it is not on the basis of this faith that we render our scientific judgments. We accept what the eye presents us only insofar as what we are presented with offers itself as the material to which we shall refer, and for which we shall

demand, a more rigorous philosophical inquiry *when the time comes*. What the eye perceives here, in these preliminary terms, *is not what is known*, at least scientifically. What we take on faith is only that what we see can be made known, is knowable, *not* the objectivity of the object (as it were) that presents itself in this visual moment. So then, the fables, superstitions, and outrightly misleading information against which Bacon is reacting here must serve to remind us of what is at stake in this natural history--i.e., precisely, the knowability of the thing, not how a thing is known--before we too quickly jump to the (inaccurate) conclusion that Bacon is an empiricist.

But if the context in which this passage must be considered challenges the efficacy of an empiricist reading of a certain faith in the eye, so too does its very content. The second clause of the second sentence, "or at least of careful and severe examination," changes entirely the emphasis that Bacon places on this faith. For indeed, the "careful and severe examination" that Bacon uses to elaborate upon his statement suggests anything *but* placing a (blind) faith in the eye. What is foregrounded here is precisely the sort of rigour that belies the perceptual efficacy of the senses in general. Bacon's constant call for "helps" for the senses--helps conceived in theoretical, and not instrumental terms--is brought to bear not only on scientific knowledge production, but even more primally on the act of, and the sense put to use for, gathering the materials of knowledge. Not only implying the sophistication of Bacon's epistemological stance vis-à-vis nature, we see also that both knowledge gathering and knowledge production are referred to the "new principle" according to which his entire project is mobilized--not the utilitarian drive for the production of works, but the philosophical decision

according to which acts of knowledge production emphasize, in their essence, the *production*, not the products, of that knowledge.

We are led back to a word of great semantic importance, the word “purveyor.” Bacon says that he is a more “cautious purveyor” of natural history, and it is crucial that we understand how “purveying” natural history reinforces the theoretical nature of what Bacon attempts to articulate here. To purvey natural history does not simply mean to “provide” it; more importantly the word implies that Bacon means to *prepare* it, suggesting once again that the material of knowledge, even if accepted on the faith of the eyes, is nevertheless gathered according to the exigencies of a specific theoretical purpose. What this means is that the material of knowledge must not simply be provided to research--it must be *prepared* for it, must already be bound to the “new principle” for which it shall eventually be mustered.

Clearly, then, Bacon decisively qualifies his suggestion that he “admits nothing but on faith of eyes,” since the eyes, like all the senses, are incapable of preparing the material of knowledge for the work of knowledge production. Bacon is quite explicit about this very point:

Knowing how much the sight of man’s mind is distracted by experience and history, and how hard it is at first (especially for minds either tender or preoccupied) to become familiar with nature, I not unfrequently subjoin observations of my own, being as the first offers, inclinations, and, as it were, glances of history toward philosophy, both by way of an assurance to men that they will not be kept forever tossing on the waves of experience, and also that when the time comes for the intellect to begin its work, it may find everything the more ready. (26-27)

Bacon here describes for us what a “cautious purveyor” of the material of knowledge is and does. We notice the manner in which Bacon re-writes the work of the eye in order

to figure the stakes of the preparation of the material of knowledge. To admit nothing but on the faith of the eye is, as we see, not enough to guarantee the accuracy or efficacy of the material we collect for our natural history, for there are different kinds of sight that are every bit as influential in its construction. Bacon (re)iterates once again the figure of the mind that we saw earlier: the mind itself, “distracted by experience and history,” is prone to misconstrue that which seems to present itself so self-evidently to the senses, especially the eye. Responding to this problem, Bacon offers “observations of his own” that function as “glances of history toward philosophy.” In other words, “observation” comes to mark a *method of seeing* according to which the “philosophy” (i.e., the end in view) towards which Bacon glances orders, in the first instance, how and what one sees. We must note here the sheer radicality of the concept of “observation”—no longer are we speaking of a simply construed “taking in” of empirically perceived phenomena, but rather a *manner* of seeing in which the immediacy of sight can still be even more primally conditioned by a theoretical position vis-à-vis what one sees. This point—to be construed as nothing less than the invention of observation—continues to be glossed over by both science studies and more traditional forms of philosophy of science. In the former case, observations tends to be associated, even conflated, with the exigencies of a knowing subject, while in the latter instance, it is simply referred to the field of empirical objectivity. Both conceptions of observation, completely correct in their own right, nevertheless withdraw from what is most remarkable, if perhaps most troubling, about the concept. Reading Bacon closely here, we discover that observation is, above all and in the first instance, an *abstraction*,

and as such, the marker of a very specific theoretical commitment to the interrogation of nature. And it is this long before it becomes a physical act. Indeed, for it to be an act of the sense at all, it must, by its very nature, be committed to a theoretical purpose (i.e. the purpose of natural inquiry), and this is Bacon's crucial insight here.

Understanding observation--and indeed, the entire rhetoric of sight and visibility that to a great degree orders Bacon's discussion of natural history--in this new light allows us to gain a fuller understanding of both the 'ends' for which this natural history is gathered, and what it means to be a more "cautious purveyor" of it. For Bacon, the stakes of this reorientation are quite clear: "when the time comes for the intellect to begin its work, it may find everything the more ready" (27). What is remarkable here is Bacon's camouflaging of the work and place of the theoretical presuppositions that ground his natural history, and such concealment continues to succeed in occulting the true stakes that inhere in such crucial Baconian philosophemes as "observation." For in truth, the intellect has begun its work prior to any act of scientific investigation--be it observation, experiment, or what have you--and *must* have done so in order that these constitutive features of natural inquiry, as well as natural history itself, could be what they are to the program that Bacon augurs with them. For indeed, much rests, for Bacon, on precisely the question of *preparing* the material of knowledge for the very observations and experiments to which it shall become subject according to Bacon's model of inquiry. As he writes, "By such an Natural History, then, as I have described, I conceive that a safe and convenient approach may be made to nature, and matter supplied of good quality and well prepared for the understanding to work upon" (27).

That the “matter” of natural history can be “prepared” at all must, finally, suggest that Bacon’s thinking demands to be considered in terms of its theoretical, not just practical, goals. Specifically, we should be given to a “theoretical consideration of the theoretical consideration” he gives to the possibility of producing knowledge capable of a kind of self replication. We are called not to read in Bacon’s text an empirical model of knowledge production, but indeed, that very model’s overturning.

What have we to gain in reading, in such detail, the outlines of a part of Bacon’s project that he never, ultimately, completed? I would argue that what Bacon offers here does not simply refer to a specific part of his project, but rather reflects the theoretical itinerary of his project as a whole. It is, precisely, the very *possibility* of conceiving and carrying out the preliminary work of a natural history according to the precepts that Bacon articulates here that must awaken us to new possibilities for understanding the stakes of his project, and its relevance to our own intellectual practices today. A natural history conceived in terms such as these cannot exist on its own, unlike the typical natural history of Bacon’s day; if it is to be gathered on a new principle, that principle here inevitably refers itself to the exigencies of a larger project, one concerned to theorize the production of knowledge for which the material of knowledge is marshaled and prepared.

3. Transition

What we have offered here is a largely revisionist reading of Bacon’s thought, one that, in essence, seeks simply to give more credit to the sophistication of his thinking than has generally been allowed. What has been emphasized, above all, has been not only

Bacon's concern with the mechanics of knowledge production, but precisely with the *manifestation* of that concern. In other words, we have come to discern, through a detailed return to Bacon's text, the very concerns that preoccupy science studies today-- Bacon's concerns are, and have always been, at the very fulcrum of what it means to participate in the "scientific enterprise," and to advocate the "advancement of learning."

In making such a claim, however, we have greatly raised the stakes of reading Bacon's project at all, for if the various configurations outlined above speak to the contemporaneity of his project, as I think they do, then it seems incumbent upon us to demonstrate in no uncertain terms its direct impact upon us. This means, in the first instance, that we must be willing to surpass the kinds of historiography of Bacon's project that tend to figure Bacon as a place-holder for science at a certain time or place in history.⁷⁸ Simon Wortham, discussing the *New Atlantis*, has made a rather important point in this regard, arguing that if it is not advisable to configure the past "rather straightforwardly as a platform for larger arguments of topical relevance," it is nevertheless equally ill-advised "to position *New Atlantis* historically according to crude notions of epoch or chronological pastness" (509). For Wortham, it is precisely because Bensalem bears an "uncanny resemblance" to both Europe and "the Enlightenment values of progress and linearity" that Bacon's text must not be historically hypostatized in/with the Renaissance. For us, it is precisely because Bacon's scientific program bears an uncanny resemblance--in even the smallest of details--to what is arguably the most important articulation of the sociology of scientific

knowledge production in the twentieth-century that we make a similar claim, in turning now to Kuhn's *The Structure of Scientific Revolutions*.

Chapter Three

Bacon, Kuhn, and the “Paradigm” Paradigm

1. Introduction

Alfred North Whitehead and Karl Raimund Popper served earlier as exemplary figures for the degree to which prominent philosophers of science of the twentieth century, in discussing Bacon, tend to avoid reading Bacon’s text even as they offer authoritative interpretations of it. In this respect, their approach to Bacon’s thought is largely a reflection of similarly problematic reading techniques exhibited by critical commentary. We have not yet made, however, what is perhaps the most important point of all concerning these philosophical misreadings. For we have yet to comment upon the degree to which Bacon’s thought conditions and enables the philosophical assumptions of these thinkers *despite* their pejorative interpretations of it. Whitehead himself, of course, acknowledges his own indebtedness to Bacon for his conception of “organism,” and attributes to Bacon the fundamental cast of mind necessary for the kind of science that Whitehead sanctions. Bacon’s positive influence on Popper is more difficult to determine, but as Peter Urbach has deftly shown, once we have dismissed the many flawed and confused readings of Bacon offered by Popper, Bacon can be seen to have articulated many of Popper’s most important assumptions long in advance.⁷⁹ In both cases, it becomes apparent that Bacon’s thought is at once the object of critical scorn while simultaneously standing as the singular condition of possibility of the very philosophical decisions that are deployed against it. More than any other thinker since the

Renaissance, perhaps, Bacon remains for the philosophy of science a double presence--a visible scapegoat of philosophical and scientific ineptitude whose largely invisible project augured, for the first time, a theoretical sophistication capable of determining--indeed, putting at stake in the first instance--the very difference between good and bad research.

It is in order to understand something of how this doubleness has infested contemporary thought concerning Bacon's importance to the scientific enterprise that we now seek to change tactics in considering the relationship between the thought of Francis Bacon and that of Thomas Kuhn. We have up to this point chosen to focus on the ways in which Bacon is misread, but as Urbach suggests in his discussion of Popper, it is just as true that Bacon's thought can be construed as a crucial part of the projects from which he is dismissed. In turning to Kuhn, I believe we have a privileged example of the manner in which Bacon is dismissed as historically unimportant to an intellectual project despite overwhelming evidence to the contrary. That this strange kind of blindness towards Bacon's work is not simply a symptom of a particular thinker's proclivities, but indeed the symptom of an entire pathology of critico-philosophical blindness, makes the strategy of our approach to Kuhn here all the more urgent an undertaking. We propose, then, not simply to elucidate the blindnesses of Kuhn's understanding of Bacon, but also to demonstrate the manner in which Kuhn's thought depends for its efficacy on Bacon's thought, despite its forceful rejection of it. In so viewing the relationship between the two thinkers, we shall discern a remarkable confluence--indeed, a clearly *necessary* one--between (at least one) contemporary conception of the movements of the scientific enterprise, and Bacon's understanding of it. In other words, we shall decisively

demonstrate not only that Bacon has relevance to the scientific enterprise of today--a claim that has been entirely dismissed by generations of Bacon scholarship--but also that his project is eminently our own.

2. Bacon meets Kuhn

While hardly a topic of seething debate, there have been a few, if entirely cursory, engagements with the question of the relation between Baconian and Kuhnian thought. The two most important statements in this regard have been made by Antonio Perez-Ramos in his erudite book, *Francis Bacon's Idea of Science and the Maker's Knowledge Tradition*, and by Mary Horton, in her suggestive article "In Defence of Francis Bacon." I begin here with Perez-Ramos's treatment of the question.

For Perez-Ramos, any attempt to place Bacon alongside Kuhn amounts to nothing short of an error in historiographical method:

By choosing to dwell on the 'ingredients of Bacon's *scientia*,' instead of, say, talking of 'paradigms,' we can bypass a question largely inspired by the evolution of astronomy (in whose context Kuhn first speaks of 'paradigms' and 'paradigm-switches') and place Bacon's idea of natural enquiry in a richer conceptual perspective. (47)

We might begin by noting, first of all, Perez-Ramos's mischaracterization of the "pedigree" of the paradigm, for it was not simply inspired by "the evolution of astronomy." As Kuhn clearly demonstrates in *The Structure of Scientific Revolutions*, the history of chemistry, of "corpuscular" and later wave physics, and of electricity and electrostatics are also privileged exemplary figures of Kuhn's articulation of the paradigm. We must not make the mistake, then, of believing Kuhn's notion of paradigm-

change to privilege just one scientific field, since to do so is to render Kuhn's thought, misleadingly I think, outside of any but the most specific historical purview.⁸⁰

Of perhaps greater importance here, however, is the need to question the suggestion that a "richer conceptual perspective" for Bacon's thought depends on removing our consideration of Bacon's text from its relation to questions of today's scientific method and practice. For what this "richer" perspective implies here is a sort of anthropology of Bacon's thought that seems largely interested in simply documenting and describing the discursive contexts--the intellectual milieu--that surrounds the emergence of his project. Now certainly, there is nothing particularly wrong-headed about such an approach, but the claims concerning Bacon's historical/intellectual significance for the history of ideas that arise out of the assumptions implicit in such an approach must give us pause. For example, Perez-Ramos writes:

On the whole, gross distortions of past texts can be avoided by an attempt to reconstruct the conceptual grammar in which they were embedded. In order to do this, the interpreter is obviously bound to look at them from two different vantage points: from the contexts of what immediately preceded and followed them. . . It is there that we can hope to unearth a textual logic of some kind. . . , that fluid fabric of meanings at one time called *scientia*. . .(45)

We will already recognize the sentiments of the opening sentence from our earlier treatment of similarly minded critics, most notably Lisa Jardine, where Bacon seems best construed as a figure of the past, and should be left to it. And as we have already noted, the problem with this kind of historiographical approach is that it entirely excludes the possibility that Bacon's "conceptual grammar," when it comes to the question of scientific knowledge production, is also the conceptual grammar of our own scientific

modernity. To be sure, Bacon's importance to contemporary scientific practices has been downplayed to such an extent that it may seem that the sort of historiographic treatment of Bacon offered by Perez-Ramos is all that is left to those few willing to take Bacon's thought seriously.⁸¹ It is precisely this reason, in fact, that allows Perez-Ramos to disqualify the possibility of a fruitful reading of Bacon and Kuhn. As he writes:

There is, besides, a more pragmatic reason for preferring this kind of approach to a Kuhnian 'catastrophism' hastily transplanted to the history of philosophy, and this lies in the nature of the subject. In Bacon, we have a privileged case-study in which such key concepts in past and present reflection on natural science as experience, experiment, or induction can be traced back to their putative source in the dawn of the modern era. The fact that these notions are also ingredients of present-day conceptions of human knowledge guarantees, I think, the interpretive legitimacy of this sort of undertaking. (47)

While appearing to be an eminently logical rejoinder to the kind of history that attempts to see the past through the eyes of the present, some crucial contradictions emerge here, particularly in light of the historiographic model that has sanctioned Perez-Ramos's approach to Bacon's text so far. We might, in order to unpack these contradictions, start with the second half of the passage above, and in particular with the suggestion that the transhistorical presence of such Baconian philosophemes as experience, experiment, and induction guarantee the efficacy--and indeed, logical consistency--of his historiographical approach. In this assertion dwells a particularly virulent contradiction, particularly if we remember Perez-Ramos's insistence on the necessity to deal only with those contextual moments "immediately before and after" Bacon announces his project. For the very fact that experience, experiment, and induction have somehow remained, since Bacon's time, constant and constitutive features of scientific practice and method *to this very day*, must

alert us to the possibility of considering Bacon's project in contexts that surpass and exceed those immediately before and after its appearance. If, indeed, it is Perez-Ramos's own contention that elements of Bacon's project persist today, why must we relegate Bacon to a historical function that clearly cannot contain the full suggestiveness of his thought?

So if, in this regard, we suggest that Bacon's text does indeed harbour more importance for our modernity than is generally acknowledged, then it is not enough that the transhistorical importance of experience, experiment, and induction "guarantee" the legitimacy of one's critico-historical approach to Bacon. On the contrary, it is the *possibility* of comprehending Bacon's thought at all--especially in such terms as those mentioned here--that must be placed at stake. In other words, we must question concerning the *nature* of that guarantee, that is, about the curious features of experience, experiment, and induction that make them transhistorical indices of scientific practice. While we have gone some way to explaining the significance of these philosophemes already in earlier chapters, it is precisely the strangely reciprocal relationship between Bacon and Kuhn that, to my mind, erases all doubt concerning Bacon's contemporaneity. Far from auguring a "gross distortion" of Bacon's text, to treat in detail the relation between Bacon and Kuhn--modernity and its "early" namesake (for namesake it is)--will, I believe, remedy the many historical distortions that have come to dominate our understanding of Bacon's thought. And really, we are speaking of just one distortion--that is, that Bacon's text belongs to the *history* of ideas, instead of being construed, as we want to suggest here, in terms of the history of *ideas*.

We are now in a position to return to the first part of Perez-Ramos's rejection of the historiographical efficacy of reading Bacon alongside Kuhn. We might note immediately, in light of the relationship that experience, experiment, and induction hold with our own modernity, that Perez-Ramos's needlessly hyperbolic characterization of Kuhn's project as a sort of "catastrophism" that is "hastily transplanted to the history of philosophy" obscures the possibility that the inverse of his assertion is in fact the case: if the transhistorical force of experience, experiment, and induction allows us to extend, rather than constrain, the historical purview and range of Bacon's thought, then it may very well be that this "catastrophism"--we prefer to call it an iterative structure of epistemological revolution--is in fact a profoundly Baconian theme, particularly given Bacon's repeated insistence on the necessity for experiment and axiom to feed reciprocally off of one another.⁸²

If we are to determine the degree to which Kuhn's thought may be preconditioned by a Baconianism of which he is unaware (a situation upon which we shall elaborate in a moment), it seems that, in the first instance, we must look to the manner in which Bacon's thought may be said to agree with Kuhn's. Mary Horton illustrates just such a trajectory for understanding the relation of Bacon's thought to the notion of the paradigm in general:

I have maintained that Bacon can be viewed as seeing himself as the 'announcer' or 'introducer' of a crisis period of paradigm change in science (whether or not he saw himself so correctly is not a matter for discussion here). Kuhn's description of the perceptual processes of scientists during an interregnum of this type is that of taking a new look at data that had previously been filed away as 'accounted for' or 'solved.' I am suggesting that this was precisely what Bacon was asking the followers of his method to do and, moreover, that he was aware that this

interregnum was a temporary state, and would be superseded by a new non-Aristotelian paradigm[.] (264)

Horton's comments here refer to an earlier footnote of her article in which the relationship between Baconian and Kuhnian thought are articulated in slightly more detail. After citing the following passage from the *Novum Organum*

No correct judgment can be formed either of our method or its discoveries by those anticipations now in common use; for it is not to be required of us to submit ourselves to the judgment of the very method we ourselves arraign. (Bk. I, Aph.33)

she goes on to note:

This quotation shows Bacon self-consciously in the position of herald or initiator of what we would now call a Kuhnian paradigm change. His [i.e., Bacon's] definition of himself as 'the bell that calls the wits together' is almost too well known to quote. The following aphorism show the fundamental nature of his rejection of contemporary ideas, and his insistence that thinkers must start again from the beginning. This is a thread that runs consistently through *Novum Organum*.

It is in vain to expect any great progress in the sciences by superinducing or engrafting new matters upon old. An instauration must be made from the very foundations. . .(Bk. I, Aph.31)

The communication problem which is an essential aspect of the interregnum of crisis period of a paradigm change is described as follows:

Nor is it any easy matter to deliver and explain our sentiments; for those things which are in themselves new can yet be only understood from some analogy to what is old. (Bk. I, Aph.34)

It is possible that some of the present-day difficulty in understanding Bacon is that, due to an effort to make his message understood by his contemporaries, he drew too many 'analogies with what is old.' For instance, his use of the word 'form' with its Aristotelian connotations, seems to have caused unnecessary confusion. (250)

It may help here to clarify precisely those features of Kuhn's argument that Horton seems to have applied to Bacon's thought. She sees, for example, in Bacon's call for a return to

and renovation of “the very foundations” of science, a certain compatibility with Kuhn’s notion of the “incommensurability” of an early model of scientific research with a later one, where what is anomalous to an early model is in fact a constituent of the world view of the latter. In this regard, scientific research is no longer deemed to be a “cumulative” historical venture, but in fact becomes an iterative one, where changes in paradigm evoke a return to and overthrow of the assumptions guiding one’s research. As Kuhn explains it:

The transition from a paradigm in crisis to a new one from which a new tradition of normal science can emerge is far from a cumulative process, one achieved by an articulation or extension of the old paradigm. Rather it is a reconstruction of the field from new fundamentals, a reconstruction that changes some of the field’s most elementary theoretical generalizations as well as many of its paradigm methods and applications. (85)

Horton also noticed, as we saw above, Bacon’s articulation of the fundamental problems in communicating the philosophical decisions of a new approach to the world or nature in terms of past models. Again, to more explicitly draw the connection between Bacon’s sentiment and Kuhn’s thought, we see that Kuhn says much the same thing when it comes to the question of resolving the incommensurability of paradigms:

More is involved [in the resolution of conflict between paradigms], however, than the incommensurability of standards. Since new paradigms are born from old ones, they ordinarily incorporate much of the vocabulary and apparatus, both conceptual and manipulative, that the traditional paradigm employed. But they seldom employ these borrowed elements in quite the traditional way. Within the new paradigm, old terms, concepts, and experiments fall into new relationships with one another. The inevitable result is what we must call, though the term is not quite right, a misunderstanding between the two competing schools. . . . Communication across the revolutionary divide is inevitably partial. (149)

Without question, Horton has hit upon a very interesting confluence between these two thinkers as concerns both the nature of redefining a field of knowledge, and the

communication of what it is that has been redefined. But Horton's treatment of the relationship here, necessarily cursory since this is only a footnote, must remain precisely that. As such, the danger emerges that the suggestive relationship discerned by Horton will be considered merely as a coincidence. And if this relationship can give us such an impression, even though we might take into account the fact that this is a necessarily hasty sketch of its significance, then we are not far from acceding to Perez-Ramos's critique--only the *hasty* transplantation of a contemporary theory of historical development can produce such coincidences, leaving us with the impression that pointed inquiry on the subject would not justify the effort or historical gymnastics it necessitates. The possibility of reading Bacon alongside Kuhn, in other words, stands in jeopardy of being relativized to the point of meaninglessness precisely by the attempt to do so. As Perez-Ramos writes of Horton's approach to the Bacon-Kuhn confluence, "This is a clear-cut example of a science-oriented reading of past philosophical texts; its Kuhnian catastrophist orthodoxy contrasts with the meager place that Bacon occupies in Kuhn's own book *The Structure of Scientific Revolutions*." To be sure, we have already isolated in Perez-Ramos's thinking an orthodoxy of his own, one of whose symptoms is precisely to divorce the scientific from the philosophical in a manner that reduces, rather than elucidates, the conceptual "richness" of Bacon's thought. What is perhaps even more telling of Perez-Ramos's historicist orthodoxy, however, is his strange gesture to Kuhn's own authoritative rejection of Bacon's thought--Perez-Ramos's evocation of the "meager place that Bacon occupies in Kuhn's own book" implies his unwillingness to accept the suggestiveness of Horton's reading for no better reason than the fact that Kuhn himself

would have rejected, with great prejudice, any such possibility. So if Perez-Ramos may be right to question what seems to be, at first glance, Horton's de-temporalizing approach--seen, for example, in her application of the term "paradigm" to Bacon's thought--the motives behind this questioning are themselves lodged in a conception of historiography that must also be considered susceptible of challenge. How then are we to question concerning this relationship without reproducing the kind of historical orthodoxy exemplified in Perez-Ramos's critique of Horton, while avoiding the impression, given by Horton, that Bacon's thought can be considered as a strangely dehistoricized example of Kuhn's theorizing?

In order to answer such a question, we need to understand what it is that the historical methods intimated by Horton and Perez-Ramos share, even despite their vast interpretive differences. What both of these readings have in common is the presupposition of a sense of history that is not only linear, but whose directionality can be said to move in only one way: from the present to the past. In other words, while it seems that we are capable of reading and addressing Bacon's assumptions and philosophical decisions, there is no provision given for the possibility that his thought may be capable of reading ours. This lack of provision is perhaps most obvious in Perez-Ramos's thinking, since the desire to recapture the immediate contexts of Bacon's thinking, and the attendant suggestion that this is the only legitimate kind of inquiry to which we can submit Bacon's text, implies the kind of "looking back" that forever discerns in a decisive manner between present and past. While Horton's reading surpasses the orthodoxy of Perez-Ramos in certain ways--particularly in its desire to see the

contemporaneity of Bacon's thought, a desire that also informs what shall follow in our inquiry--Bacon is nevertheless figured as a function of Kuhn's thought, and as such, the product of the present, rather than in any way a constituent of it. It is, precisely, our suggestion that Bacon is indeed constitutive of contemporary conceptions of scientific practice--a claim that is pervasively rejected today--that must necessitate a different approach to the question, not at all certain at the moment, of the validity of associating Baconian and Kuhnian thought.

3. The Meanings of Paradigm and the Rejection of Bacon.

How may we justify this historical gymnastic, this suggestion that Bacon is capable of reading our thoughts? We might begin answering this question by addressing Kuhn's understanding of Bacon, as well as Perez-Ramos's contention that Bacon's thought inhabits a "meager" place in Kuhn's articulation of the structure of scientific revolutions. It may be true that Bacon is mentioned only a few times by Kuhn at the beginning of his text, but the use to which Bacon is put, precisely as a place-holder for that which cannot be construed to be "modern" in its historiographic and scientific practices, marks a crucial move for the intelligibility of paradigmatic thinking. In this regard, far from holding a "meager" place in Kuhn's sociology of knowledge, Bacon holds a *necessary* one, necessary in the sense that Bacon's thought is construed to mark the threshold between pre-modern, disorganized, and ill-conceived research practices, and the modern, organized, and methodologically "mature"--Kuhn's privileged metaphor--practices of the likes of Bacon's contemporary, Galileo, and later scientists like Boyle and Newton. Since it is precisely this point concerning Bacon that also infuses

most modern treatments of his thought, it behooves us well to consider the specifics of Kuhn's rejection of Bacon's project, a rejection that fails in decisive ways to construe accurately Bacon's text, and thus his place, in the history of scientific revolution. That rejection appears most plainly in the following passages, where "early fact-gathering" methods are critiqued for not being "paradigm" driven:

History suggests that the road to a firm research consensus is extraordinarily arduous.

History also suggests, however, some reasons for the difficulties encountered on that road. In the absence of a paradigm or some candidate for paradigm, all of the facts that could possibly pertain to the development of a given science are likely to seem equally relevant. As a result, early fact-gathering is far more nearly a random activity than the one that subsequent scientific development makes familiar. Furthermore, in the absence of a reason for seeking some particular form of more recondite information, early fact-gathering is usually restricted to the wealth of data that lie ready to hand. (15)

Kuhn does not name Bacon explicitly here, at least not at first. But as we read on, we discover that it is precisely Bacon that Kuhn has in mind when critiquing the practices of this kind of fact-gathering. It is worth quoting what follows at some length:

But though this sort of fact-collecting has been essential to the origin of many significant sciences, anyone who examines, for example, Pliny's encyclopedic writings or the Baconian natural histories of the seventeenth century will discover that it produces a morass. One somehow hesitates to call the literature that results scientific. The Baconian "histories" of heat, color, wind, mining, and so on, are filled with information, some of it recondite. But they juxtapose facts that will later prove revealing (e.g., heating by mixture) with others (e.g., the warmth of dung heaps) that will for some time remain too complex to be integrated with theory at all. In addition, since any description must be partial, the typical natural history often omits from its immensely circumstantial accounts just those details that later scientists will find sources of important illumination. . . . Moreover, since the casual fact gatherer seldom possesses the time or the tools to be critical, the natural histories often juxtapose [confirmable] descriptions. . . with others, say, heating by antiperistasis (or by cooling), that we are now quite unable to confirm. Only very occasionally, as in the

cases of ancient statics, dynamics, and geometrical optics, do facts collected with so little guidance from pre-established theory speak with sufficient clarity to permit the emergence of a first paradigm. (16)

From the above two passages, we may discern at least seven indictments of early-modern fact-gathering in general, and by extension, of Bacon's thought in particular. These indictments unfold as follows:

i) *Random Fact-Gathering*--early fact-gathering is a "nearly random activity" precisely because it lacks the order that a paradigm offers.

ii) *The Invisibility of the Invisible*--early fact-gathering is restricted to data that is "ready to hand" because it lacks any impulse to disclose the recondite.

iii) *The Junk-Pile of Knowledge*--early fact-gathering, in lacking any methodological or theoretical underpinnings (that is, in not being paradigm-driven), produces an unscientific "morass" of knowledge that is hardly useful to the kinds of scientific practices that will succeed such natural histories.

iv) *The Resistance to Theory*--early fact-gathering often juxtaposes "revealing" facts with those that are incapable of being "integrated" with an overarching theoretical position.

v) *Being Behind the Times*--early fact-gathering, in being an overwhelmingly "circumstantial" enterprise, often omits precisely those pieces of knowledge that will be most important to later scientists.

vi) *Naiveté*--early fact-gathering, lacking the time or tools necessary for thorough taxonomical collection, ultimately lacks the necessary feature of critical insight concerning what has been collected.

vii) *The Lack of Theory*--early fact gathering lacks theoretical guidance, and thus is able to set the stage for the emergence of a paradigm in only the rarest of instances.

We cannot fail to notice, of course, a certain amount of overlap here--the randomness of fact-gathering (i) implies the morass such randomness will produce (iii), in turn gesturing to a lack of theoretical guidance (vii). The construal of a lack of theoretical guidance for a project like Bacon's (vii) is precisely what sanctions the related suggestions that early fact-gathering had no mechanism with which to investigate the unknown (ii), and thereby no ability to theoretically integrate the anomalous as such (iv). And a form of fact-gathering that does not predict the preferences of later scientists (v) will obviously imply, to one who so judges such things, a certain historical naiveté (vi), the very naiveté that we have already commented upon in the work of Whitehead and Popper. While many of Kuhn's generalizations seem eminently coherent, particularly in light of Bacon's reception in both the local commentaries on his work and in the philosophy of science more broadly, the fact remains that Kuhn makes no effort to substantiate any of the seven claims above against Bacon's own conception of the place of natural history or the larger intellectual project to which it is meant to contribute. Indeed, most of Kuhn's claims above disqualify entirely the possibility that there is a larger project to which Bacon's natural history is meant to refer. This is, however, precisely the case for Bacon's project, a situation in urgent need of demonstration.

We must, then, be clear on a crucial point--this anatomy of the failings of "early fact-gathering" is every bit as much an anatomy of the success of the paradigm, for it is the paradigm itself--i.e., the paradigm as theory--that names the shift away from pre-

modern epistemological practices in natural inquiry. It is clear that these seven indictments are in essence simply different aspects of the concept of the paradigm, and their apparent lack in Bacon's thought is testimony, above all, to his pre-paradigmaticity.⁸³ In this cascade of methodological and critical failures, forming dialectically the counter against which the paradigm will be displayed in all its critical glory, emerges the fundamental presupposition of the paradigm itself as an epistemological model capable of judging the past--indeed, the articulation of these shortcomings can only be intelligible *as* shortcomings if something like paradigmatic thinking is presupposed. It seems, then, that the seven indictments are largely conceived by Kuhn not only as indictments of Bacon, but as testimonials to the efficacy of the paradigm itself. If we mean to suggest, as we certainly mean to here, that these indictments mischaracterize, and in fact conceal certain crucial elements of Bacon's project, then we need to understand precisely what Kuhn means by "paradigm"--its commonplace conception as a "model" of the world, while germane, does not adequately unpack its complexity. Let us begin then by recalling precisely what it is that a paradigm is meant to represent. In doing so, we shall be in a better position to question the efficacy of Kuhn's seven indictments of early modern fact-gathering.

In his "Postscript" to *The Structure of Scientific Revolutions* in 1970, Kuhn notes that the term "paradigm" can be understood as the answer to the following question: "What do [the members of a particular scientific community]. . .share that accounts for the relative fullness of their professional communication and the relative unanimity of their professional judgments" (182)? Kuhn uses this question/answer form to clarify what

one reader discerned to be “at least twenty-two” different usages of the term paradigm (181). As we can see here, this question, for which “a paradigm” is the answer, points not simply to a model of the world, but more precisely to the fact that such a model is always and everywhere a *shared* model—as Kuhn says, “As in political revolutions, so in paradigm choice—there is no standard higher than the assent of the relevant community” (94). Nevertheless, such paradigms, if unanimously assented to, are neither interpreted in a singular way, nor are they perfectly heuristic. Indeed, as Kuhn elaborates, “They [scientists] can. . .agree in their *identification* of a paradigm without agreeing on, or even attempting to produce, a full *interpretation* or *rationalization* of it” (44—original emphasis). The paradigm, then, can be considered at once to be both the map of the knowledge of a particular field, and a model capable of indicating new and continuing directions for map-making itself (109), precisely by fostering competing interpretations of the constituents of a paradigm without challenging its existence or necessity.⁸⁴

Even before we enter upon a more detailed discussion of the paradigm, especially concerning its constitutive components of “normal” and “revolutionary” science, we may already discern a striking similarity between Kuhn’s emphasis on the “shared” status of the paradigm, and Bacon’s call for a similarly community-oriented form of scientific practice. Bacon writes, for example:

Another defect which I note, ascendeth a little higher than precedent: for as the proficience of learning consisteth much in the orders and institutions of Universities in the same states and kingdoms, so it would be yet more advanced, if there were more intelligence mutual between the Universities of Europe than now there is. . .And surely, as nature createth brotherhood in families, and arts mechanical contract brotherhoods in commonalities, and the anointment of God superinduceth a brotherhood in

kings and bishops; so in like manner there cannot but be a fraternity in learning and illumination. . .(67)

Where Kuhn depends on the existence of communities for the valorization of a given paradigm, we see that Bacon had no such luxury. Indeed, it is precisely his call for the constitution of such intellectual communities, (realized not long after his death with the formation of the Royal Society), that can be said to set the stage for the possibility of paradigmatic thinking at all, insofar as it is the vagaries of community opinion that for Kuhn ultimately determine the shape and movement of paradigm change. We might notice, furthermore, that Bacon's call for the constitution of a scientific community is meant to serve a very "paradigm-like" purpose. As he writes:

This same unprofitable subtlety or curiosity [found in the disputations of the Scholastics and logicians] is of two sorts; either in the subject itself that they handle, when it is a fruitless speculation or controversy, (whereof there are no small number both in Divinity and Philosophy,) or in the manner or method of handling of a knowledge, which amongst them was this; upon every particular position or assertion to frame objections, and to those objections solutions; which solutions were for the most part not confutations but distinctions: whereas indeed the strength of all sciences is, as the strength of the old man's fagot, in the band. *For the harmony of a science, supporting each part the other, is and ought to be the true and brief confutation and suppression of all the smaller sort of objections.*" (26--my emphasis)

We should recall, in this context, Kuhn's condemnation of Baconian natural history, seen earlier, in which the absence of a "candidate" for a paradigm produces an entirely random interrogative strategy that is restricted to data that is ready to hand. As we can see here, Bacon *also* targets precisely those knowledge gathering practices that lead to the very situation that Kuhn condemns. But it is the final sentence that is perhaps most compelling, for it names what is perhaps the most crucial aspect of paradigm articulation

in terms of its impact on the research scientist and her search for knowledge. As Kuhn says:

When the individual scientist can take a paradigm for granted, he need no longer, in his major works, attempt to build his field anew, starting from first principles and *justifying the use of each concept introduced*. That can be left to the writer of textbooks. Given a textbook, however, the creative scientist can begin his research where it leaves off and thus concentrate exclusively upon the subtlest and most esoteric aspects of the natural phenomena that concern his group. (20—my emphasis)

In order to be able to “concentrate exclusively upon the subtlest and most esoteric aspects of . . . natural phenomena,” one must be able to surpass the necessity to deal with, in Bacon’s words, “every particular position or assertion.” In other words, both Bacon and Kuhn name a kind of approach to natural phenomena that can take a certain model of the world for granted precisely in order to avoid erecting and tearing down one’s methodological scaffolding for every new question that arises. What makes Bacon’s thinking so crucial here, however, is that it does not concern just one group of scientists, but encompasses the very epistemological grounds upon which science *qua* science will be undertaken. In this regard, we can understand Bacon to be laying the foundations, the enabling conditions, of the sort of paradigmatic thinking that Kuhn will articulate some 350 years later. This is the first example in Bacon’s thinking of what we can call the “paradigm paradigm,” the grounding conditions of a mode of thinking that will not be explicitly formalized until Kuhn’s writing, but that, as Kuhn’s own writing demonstrates so convincingly, is the fundamental theoretical constituent of scientific advance since shortly after Bacon’s death, beginning with the scientists (like Boyle) of the Royal Society.

What I want to emphasize here is the difference between what we are proposing and what Horton proposed in terms of the confluence between Bacon's and Kuhn's thought. At first glance, it may seem as if we, like Horton, are attempting to construct a kind of "one-to-one" relation between certain ideas of the two thinkers. And to be sure, part of what justifies our intentions is precisely the degree to which this sort of thing is possible; as we shall continue to elaborate, the sheer number of details in which the two projects agree is unprecedented, and marks a confluence that must surpass the staid protests of current historiographical conceptions of Bacon's thought (Jardine, Perez-Ramos, Solomon). Yet if it were *only* these remarkable confluences grounding our argument for Bacon's contemporaneity, suggestive as these might be, such a position would be relegated to the historically unconvincing project of taxonomically cataloguing some interesting, but ultimately "mere," coincidences. What must remain ever before us is the fundamental difference between Baconian and Kuhnian projects that we noted above, that is, the difference in their epistemological scope. For it must be remembered that Bacon's articulation of a new manner of undertaking scientific inquiry did not have the luxury of anything like the kind of epistemological environment that Kuhn came to take for granted. Indeed, Bacon might well be construed to have *invented* this environment, a crucial facet of his project that goes entirely ignored by commentary on his thought--such elision may explain, for example, why Horton (as just one critic among many) privileges Book II of the *Novum* over Book I as an explanation of Bacon's experimental science. Part of what it means, then, to draw a parallel between Kuhnian and Baconian thought while at the same time maintaining this fundamental difference

between them is not at all to demonstrate where their projects diverge, but in fact to demonstrate precisely why it is that they can be related at all--why it is that there can be so much similarity in the minutiae of projects some 350 years apart, one articulated before, and one after, the all-important industrial/technological revolutions. Bacon invents the very epistemological criteria by which the advancement of learning, as scientific revolution, can take place--that is, the paradigm of the paradigm, or the "paradigm paradigm."

We can note, in this regard, one very potent instance of this "difference-as-enabling-condition" in discerning what Kuhn sees to be the epistemological target of paradigmatic thinking. Consider, for example, where it is that Kuhn places the most emphasis in the determination, and attendant description, of a paradigm shift:

The most obvious examples of scientific revolutions are those famous episodes in scientific development that have often been labeled revolutions before. Therefore, . . . we shall deal repeatedly with the major turning points in scientific development associated with the names of Copernicus, Newton, Lavoisier, and Einstein. More clearly than most other episodes in the history of at least the physical sciences, these display what all scientific revolutions are about. Each of them necessitated the community's rejection of one time-honoured scientific theory in favour of another incompatible with it. Each produced a consequent shift in the problems available for scientific scrutiny and in the standards by which the profession determined what should count as an admissible problem or as a legitimate problem-solution. And each transformed the scientific imagination in ways that we shall ultimately need to describe as a transformation of the world within which scientific work was done. (6)

If it is true that the "revolutions" emphasized by Kuhn are conceived to be representative of scientific revolution in general, the circularity of such a characterization must nevertheless be acknowledged here--Kuhn has "obvious" examples of revolution ready-made before him, and need not spend any significant time proving that a revolution is a

revolution--the fact that a phrase like “scientific scrutiny” can have any positive meaning in the context above is just one symptom of an epistemological outlook regarding nature being taken for granted. In other words, Kuhn takes for granted an epistemological outlook wherein revolution itself is fundamental to its constitution; it is revolution--*internally coherent as such*--that is able to transform the scientific imagination, and thus the world along with it.

Bacon, obviously enough, did not have this kind of epistemological structure in place when he first articulated his methodological overhaul of natural philosophy. That is to say, he did not have a series of revolutions by which to judge the “advancement” (or as Kuhn says, “development”) of scientific knowledge. Indeed, it is precisely Bacon’s position that such advancement was impossible according to the reigning conception of the production of knowledge endemic to the logic of the scholastics. As he writes:

Solomon excellently setteth it down, *If the iron be not sharp, it requireth more strength; but wisdom is that which prevaieth*; signifying that the invention or election of the mean is more effectual than any inforcement or accumulation of endeavours. This I am induced to speak, for that (not derogating from the noble intention of any that have been deservers towards the state of learning) I do observe, nevertheless, that their works and acts are rather matters of magnificence and memory, than of progression and proficience; and tend rather to augment the mass of learning in the multitude of men, than to rectify or raise the sciences themselves. (62)⁸⁵

For Bacon, the intellectual practices of his day did not speak to the advancement of learning at all, but rather to the advancement of a kind of intellectual technique that tended simply to reproduce its own assumptions, and any “works and acts” based thereupon--this is not far from what Kuhn will critique as the mischaracterization of the scientific endeavour in terms of precisely the same logic of accumulation of discoveries.

Insofar as we see here a facet of the sort of circular disputation against which Bacon lobbied, it seems clear that quite another conception of the production of knowledge was dominant for him. And again, there is very little in the way of epistemological revolution--scientific or otherwise--at stake for the intellectuals of Bacon's day (at least as far as Bacon was concerned).

For Kuhn, then, revolutions inevitably give rise to a shift in the way we see the world, yet it is nevertheless the world itself that gives rise to revolution (ie. the manner in which the datum of the world, as anomaly, cause our received scientific practices to fail). *Precisely the inverse is the case for Bacon.* Part of what may define Kuhn's blindness concerning the importance of Bacon's thought has to do with what Bacon perceived to be the task of his articulation of the advancement of learning: for him, the way in which the world is perceived must be shifted *before* science itself--in the manner in which we conceive it today at least--can be possible at all. Again, we have adequately demonstrated the degree to which Bacon's critique of the scholastics and logicians--and especially of the syllogism--can be said to configure this shift.

What is perhaps most remarkable about this epistemological distinction between Bacon and Kuhn is that it produces two conceptions of scientific advancement that agree in startling detail, and it is time that we dwelt upon these details more closely, keeping ever before us the sharp contrast in epistemological environments that produce these remarkable agreements. Having examined these confluences, we shall be in a better position to comment upon the significance of the underlying difference that, strangely,

enables them. The most important of these details concerns what are for Kuhn the fundamental constituents of paradigmatic thinking: normal and revolutionary science.

4. Normal and Revolutionary Science

The most important constitutive elements of the paradigm as such are the concepts of normal and revolutionary science, for it is the change in their respective practices that are often considered by Kuhn to augur a paradigm shift. Normal science is the “actualization” of the theoretical promises that a particular paradigm holds out for its practitioners. As Kuhn writes, this actualization is “achieved by extending the knowledge of those facts that the paradigm displays as particularly revealing, by increasing the extent of the match between those facts and the paradigm’s predictions, and by further articulation of the paradigm itself” (24). In other words, normal science can be conceived as the “mop-up” work done in the wake of a paradigm shift (i.e. revolution), a mop-up conceived in terms of a kind of puzzle-solving activity where the limits of a paradigm can be tested and expanded as long as its assumptions can be taken for granted. In this regard, it is important to remember, as Kuhn says, that “No part of the aim of normal science is to call forth new sorts of phenomena; indeed those that will not fit the box are often not seen at all” (24). In this determination, according to Kuhn, normal science produces the conception that scientific advance is best conceived as a cumulative endeavour, since research undertaken according to the limits and prescriptions of a particular paradigm will inevitably produce the impression that discoveries are somehow “stackable.”

Normal science, as scientific practice, stands in marked contrast to the kinds of scientific behaviours that emerge when a paradigm begins to decay, usually due to the

appearance of precisely those kinds of phenomena--anomalies--that Kuhn notes may not even appear when a paradigm is in its prime. When this decay begins, the assumptions about the world that normal science can take for granted no longer hold their epistemological efficacy, and revolutionary, or extraordinary, science takes place. By extraordinary science Kuhn means, precisely, "the tradition-shattering complements to the tradition-bound activity of normal science" (6). Scientific revolutions, furthermore, "are here taken to be those non-cumulative developmental episodes in which an older paradigm is replaced by an incompatible new one" (92). And it is precisely the difference between these two conceptions of science that lead to a distinction between types of scientists: while normal scientists conduct research on or according to an existing paradigm, carrying out the puzzle-solving activity in what is, especially today, a largely academic environment, the revolutionary scientist, who may or may not be part of that academic environment and its attendant world view,⁸⁶ becomes something of a "mad scientist," engaging in the search for a new paradigm in the at times rather messy wake of the faltering old one.

For Bacon, this distinction between styles of science--the normal and the revolutionary--is an absolutely crucial one, and he articulates precisely this distinction a number of times throughout his project. In the *Advancement*, there is one moment in particular in which Bacon can be seen not only to discern between these styles of science, but to explain the necessity, and to a certain degree the provenance, of such a distinction. He writes:

If then it be true that Democritus said, *That the truth of nature lieth hid in certain deep mines and caves*, and if it be true likewise that the alchemists

do so much inculcate, that Vulcan is a second nature, and imitateth that dextrously and compendiously, which nature worketh by ambages and length of time, it were good to divide natural philosophy into the mine and the furnace: and to make two professions or occupations of natural philosophers, some to be pioneers and some smiths; some to dig, and some to refine and hammer: and surely I do best allow of a division of that kind, though in more familiar and scholastical terms; namely, that these be the two parts of natural philosophy,—the *inquisition of causes*, and the *production of effects; speculative, and operative; natural science and natural prudence.* (90—original emphasis)

Though the metaphors may differ, there can be no question concerning the remarkable similarity in the understandings of scientific work propounded by Bacon and Kuhn. Indeed, the difference between Kuhn and Bacon on the question of differentiating between types of scientific activity rests merely with the metaphors chosen to describe that activity. If Kuhn chooses the metaphor “normal” to describe a certain kind of research practice (and we can not forget that this *is* a metaphor), Bacon chooses the “furnace,” or ultimately “operation,” to describe precisely the same mode of knowledge production. For just as Kuhn makes it clear that normal science is meant to refine the limits of the paradigm, so too does Bacon make it clear that this metaphorical furnace is the place where newly mined knowledge is “refined and hammered.” This “mine,” furthermore, with its attendant metaphor of “digging” for knowledge, is the precise equivalent of Kuhn’s notion of “revolutionary” modes of knowledge production, insofar as Kuhn’s conception of extraordinary science as a kind of reversion to the “willy-nilly” pre-paradigm state reflects the turn, in Bacon’s thinking, to the search for “causes,” to “speculation” as such. Above all, however, what must be noticed here is the originary impulse to distinguish, in the first instance, between types of scientific activity. For without this distinction, the very concept of a paradigm would be meaningless, since for

Kuhn, the existence of a paradigm is attested to by the normal research activity, while the possibility of *multiple* paradigms depends entirely on their ability to be overturned, and the necessary existence of a kind of extraordinary research that both enables their overthrow *and* augurs their replacement.

One question still remains, however, though we have already gestured in some small degree to its answer. Why, if Bacon can be said to have articulated the fundamental constituents of paradigmatic thinking, does he not articulate the theoretical entity of the paradigm itself? We cannot fall back on the notion that this question is historically irresponsible, since it is precisely our contention that Bacon is the paradigmatic thinker *par excellence*. How, then, to answer this question?

Part of our approach here has to concern the difference in epistemological environments, mentioned earlier, between the two projects, and specifically with the fact that Bacon lacked an exemplary instance of scientific revolution. The word "lacked," it should be noted, can be quite misleading in this instance, since in suggesting the absence of revolution, we run the risk of simultaneously suggesting its possibility. Even if there existed, during the Renaissance and before, something like scientific revolutions as we have come to understand them, it is part of our premise in drawing so close a relation between Bacon and Kuhn that such revolutions would not have been recognized in such terms at all during Bacon's time or before. It is, in fact, the possibility of revolution itself, the possibility of epistemological change, and not its absence or lack, that we claim Bacon to have articulated. It does not make sense, then, to look for the clearly articulated conception of the paradigm presented by Kuhn in Bacon's work. But it *is* possible to

discern there certain “proto-paradigmatic” concepts--the paradigm’s enabling conditions--that invariably shape the contours of paradigmatic thinking as we now know it through Kuhn.⁸⁷ We have already gestured to two of these: the communal orientation of a paradigm, and what both thinkers describe as the necessity of a paradigm for the conducting of (a certain kind of) research via the suppression of “minor” inconsistencies. It behooves us now to look at some more of what we shall term “paradigm concepts,” and the manner in which they are shared by the Baconian and Kuhnian projects.

5. Rules and Authority

As we have noted above, the conduction of a regime of normal science depends on a pre-existing paradigm, a model that sanctions its practices. Normal science itself, however, never calls into questions the efficacy of the paradigm. As Kuhn writes:

In so far as he is engaged in normal science, the research worker is a solver of puzzles, not a tester of paradigms. Though he may, during the search for a particular puzzle’s solution, try out a number of alternative approaches, rejecting those that fail to yield the desired result, he is not testing the *paradigm* when he does so. Instead he is like the chess player who, with a problem stated and the board physically or mentally before him, tries out various alternative moves in the search for a solution. These trial attempts, whether by the chess player or by the scientist, are trials only of themselves, not of the rules of the game. They are possible only so long as the paradigm itself is taken for granted. (144-145--original emphasis)

Now consider Bacon’s manner of describing the stakes of precisely this internally coherent structure of knowledge production:

But yet it holdeth not in religion alone, but in many knowledges, both of greater and smaller nature, namely, wherein there are not only *posita* but *placita*; for in such there can be no use of absolute reason. We see it familiarly in games of wit, as chess, or the like: the draughts and first laws of the game are positive, but how? merely *ad placitum*, and not examinable by reason; but then how to direct our play thereupon with best

advantage to win the game, is artificial and rational. So in human laws, there may be grounds and maxims which are *placita juris*, positive upon authority, and not upon reason, and therefore not to be disputed: but what is most just, not absolutely but relatively, and according to those maxims, that affordeth a long field of disputation. (*Advancement*, 211-212)

If it seems, at first, that a fundamental difference in contexts exists here—i.e., Kuhn speaks of science, while Bacon seems to speak mainly, if not only, about religion, this difference becomes less divisive when we remember how closely Kuhn linked scientific work with the work of theology precisely on the question of authority. As Kuhn writes,

“Only when the nature of that authority [i.e., the authority of the textbook as purveyor of the practices of normal science] is recognized and analyzed can one hope to make historical example fully effective. Furthermore. . . the analysis now required will begin to indicate one of the aspects of scientific work that most clearly distinguishes it from every other creative pursuit except perhaps theology” (136).

Perhaps, indeed, because of precisely this connection, the points of contact here are manifold and suggestive. Both speak, generally, of the nature of an internally coherent system of knowledge, and both come to articulate it in coeval terms—it is, above all, communal authority that governs movements of self-referential systems of this sort. Bacon and Kuhn can be seen to agree further in their characterization of a prior belief in a paradigm to the exclusion of, in Bacon’s terms, “absolute reason”; again, we might recall Kuhn’s suggestion, presented earlier, that one can agree on a paradigm without offering an interpretation of it, a perfect example of what Bacon means by the authority of the “ad placita” in the above statement.⁸⁸ Indeed, the fact that both thinkers choose chess, the epitome *par excellence* of a self-referentially motivated puzzle, as their primary figure in this instance testifies, I think, to the remarkable degree of agreement on this all-important configuration of authority and belief as it functions in the production of knowledge. And

if we think the fact that the privileging of chess in both instances is simply a coincidence, such thoughts are dispelled when we witness yet another confluence of exempla on the question of theory choice.

6. Theory Choice and Paradigm Change

Of important consideration for Kuhn in the determination of paradigm change and the various shifts that accompany the acceptance and overthrow of a particular paradigm is the question of theory choice. What interests us in particular is the remarkable similarity between the Baconian and Kuhnian projects in their understanding of the function of theory in the “advancement” of the scientific enterprise. Kuhn’s discussion of the shift between Ptolemaic and Copernican cosmological models is perhaps his most important discussion of the nature of theory choice and paradigm change:

Look first at a particularly famous case of paradigm change, the emergence of Copernican astronomy. When its predecessor, the Ptolemaic system, was first developed during the last two centuries before Christ and the first two after, it was admirably successful in predicting the changing positions of both stars and planets. No other ancient system had performed so well; for the stars, Ptolemaic astronomy is still widely used today as an engineering approximation; for the planets, Ptolemy’s predictions were as good as Copernicus’. But to be admirably successful is never, for a scientific theory, to be completely successful. (67-68)

Kuhn will go on to discuss the “minor discrepancies” between the Ptolemaic theory and “the best available observations” that ultimately lead to the success of the Copernican theory. But what interests us here, for the moment, is the manner in which Bacon characterizes, for the purposes of his project, the relationship between the Copernican and Ptolemaic models. As he writes:

For although Aristotle, as though he had been of the race of the Ottomans, thought he could not reign except the first thing he did he killed all his

brethren; yet to those that seek Truth and not magistrality, it cannot but seem a matter of great profit, to see before them the several opinions touching the foundations of nature: not for any exact truth that can be expected in those theories; for as the same phenomena in astronomy are satisfied by the received astronomy of the diurnal motion, and the proper motions of the planets, with their eccentrics and epicycles, and likewise by the theory of Copernicus, who supposed the earth to move (and the calculations are indifferently agreeable to both), so the ordinary face and view of experience is many times satisfied by several theories and philosophies; whereas to find the real truth requireth another manner of severity and attention. . .So as in the meantime it is good to see the several glosses and opinions upon nature, whereof, it may be, every one in some one point hath seen clearer than his fellows. . .(103-104).

Yet again, we see Bacon and Kuhn using precisely the same example to demonstrate precisely the same epistemological point, a double confluence that testifies convincingly to the close relationship and theoretical outlook on the production of knowledge that the two projects share. Bacon acknowledges the same importance of the plurality of theoretical models that Kuhn articulates to be a symptom of a crisis period in scientific practice. What is just as remarkable is that Bacon makes the very same observations concerning the relationship between Ptolemaic and Copernican cosmologies as does Kuhn--like Kuhn, Bacon see both theories to reflect nature in largely the same degree of accuracy and efficacy. And what may also be convincing evidence of Bacon's contemporaneity, in this regard, is precisely his willingness to preserve multiple theories to explain a particular phenomenon, demonstrating a clear understanding of the fact that multiple theories stand a better chance of explaining in greater detail and accuracy the phenomenon being theorized. But also, and on the other hand, just as Kuhn suggests that a successful theory is never ultimately a perfect one, so too does Bacon make the similar point that while one or more theories may adequately explain, in this instance, "the

proper motions of the planets,” it is nevertheless also the case that the “real truth requireth another manner of severity and attention,” which is to say precisely what Kuhn implies himself, that is, that theory change always ultimately demands a new and different way of seeing the world. It is worth noting, in this regard, that Bacon does not place his own Ptolemaism at stake in this crucial articulation of the plurality of theories, a move that entirely refutes those readings of Bacon that denigrate his thinking because of his “backward” beliefs. Bacon sees beyond the success or priority of any single theory, including his own partisan beliefs, and looks towards the relationship between theory change and the advancement of learning, an interimplication that informs Kuhn’s thought in no uncertain terms. It is the change in world view suggested here that leads to our next point of contact between the two thinkers.

7. The Double Labour: Naming the New with the Old

For Kuhn, a new paradigm brings with it a new way of seeing the world. And yet, this new paradigm is incapable of being articulated coherently without some reference to the old paradigm. As he writes

Since new paradigms are born from old ones, they ordinarily incorporate much of the vocabulary and apparatus, both conceptual and manipulative, that the traditional paradigm had previously employed. But they seldom employ these borrowed elements in quite the traditional way. Within the new paradigm, old terms, concepts, and experiments fall into new relationships with the other. (149)

Indeed, new configurations of old forms of knowledge generally lead to irrevocable rifts among scientists themselves, for even if one paradigm emerges out of another, it is usually the case, as Kuhn remarks, that “[n]either side will grant all the non-empirical assumptions that the other needs in order to make its case” (148). For Kuhn, the shift

from one paradigm to another is “a conversion experience that cannot be forced,” a movement that is rarely, if ever, accomplished through mere persuasion. For Bacon, the stakes of articulating new knowledge are remarkably similar. He writes

Another diversity of judgment in the delivery and teaching of knowledge is according unto the light and presuppositions of that which is delivered; for that knowledge which is new, and foreign from opinions received, is to be delivered in another form than that that is agreeable and familiar. . . For those whose conceits are seated in popular opinions, need only but to prove or dispute; but those whose conceits are beyond popular opinions, have a double labour; the one to make themselves conceived, and the other to prove and demonstrate: so that it is of necessity with them to have recourse to similitudes and translations to express themselves. . .for it is a rule, that whatsoever science is not consonant to presuppositions, must pray in aid of similitudes. (143-144)

It may seem, at first, as if Bacon is recommending the very kind of persuasion that Kuhn remarks is inadequate to the task bringing a scientist beholden to an old paradigm into allegiance with a new one. Yet as we see with Bacon, there are different kinds of persuasion at stake, and what must be avoided at all costs is the kind of persuasion that renders new ideas in terms agreeable to the very conceptions they are meant to replace. If Bacon does offer a positive function for persuasion in the shift between old and new ideas, this is still precisely the kind of persuasion that is meant to be uncompromising in maintaining its vital distinction from the body of knowledge out of which it grows. It is precisely the difficulty in avoiding the pitfall of being *too* compromising that both Bacon and Kuhn, in their own ways, emphasize in the articulation of new knowledge, a position that leads to what is at once both an uncompromising and importuning stance concerning the articulation of both projects.⁸⁹ Yet above all, what is perhaps the most important point to be made here, even as it is the most obvious, is the fact that both draw attention to the

same problem--the transmission of new knowledge--and address it in the same manner--i.e., by pointing out the necessity to articulate the new with the old. It seems that Kuhn's discussion of the manner in which theory choice is determined by the theories preceding the new one finds its precursor in Bacon's "recourse to similitudes," a recourse that names the essentially catachrestical movements of new theory articulation.

8. The Question of the Question

We have already noticed how important the question itself is to Bacon's project, insofar as a particular kind of question--eminently self-reflexive in nature--comes to the fore in Bacon's overhaul of scientific method. The question as such--ie., the proper question--is also of great importance to the construction of the paradigm in Kuhn's determination, since the types of questions permitted or foregrounded by a paradigm determine the course of research itself. As Kuhn writes,

We have already seen. . .that one of the things a scientific community acquires with a paradigm is a criterion for choosing problems that, while the paradigm is taken for granted, can be assumed to have solutions. To a great extent these are the only problems that the community will admit as scientific or encourage its members to undertake. (37)

Furthermore, what often characterizes paradigm change as we have discussed it in the previous two sections above is precisely the manner in which shifts in paradigm are accompanied by shifts in precisely those questions that are privileged as constitutive of it.

Kuhn:

We have already seen several reasons why the proponents of competing paradigms must fail to make complete contact with each other's viewpoints. Collectively these reasons have been described as the incommensurability of the pre- and post-revolutionary normal-scientific traditions. . .In the first place, the proponents will often disagree about the list of problems than any candidate for paradigm must resolve. (148)

We notice here that the question, as such, is always a proper question when construed in terms of the paradigmatic conditions that constitute its “askability,” so to speak. Bacon’s position on this may not seem entirely clear, at first:

The other part of invention, which I term suggestion, doth assign and direct us to certain *marks*, or *places*, which may excite our mind to return and produce such knowledge as it hath formerly collected, to the end we may make use thereof. . . Neither may these Places serve only to apprompt our invention, but also to direct our inquiry. For a faculty of wise interrogating is half a knowledge. For as Plato saith, *Whoever seeketh, knoweth that which he seeketh for in a general notion: else how shall he know it when he hath found it?* and therefore the larger your anticipation is, the more direct and compendious your search. (129)⁹⁰

Much depends in this passage on understanding what Bacon means by “marks” and “places,” and this comes somewhat further on:

I do receive particular Topics (that is, places or directions of invention and inquiry in every particular knowledge,) as things of great use, being mixtures of Logic with the matter of sciences; for in these it holdeth, *ars inveniendi adolescit cum inventis* [every discovery increases the art of discovery]; for as in going of a way, we do not only gain that part of the way which is passed, but we gain better sight of that part of the way which remaineth: so every degree of proceeding in a science giveth a light to that which followeth; which light if we strengthen by drawing it forth into questions or places of inquiry, we do greatly advance our pursuit. (129)

As we see from this latter passage, “marks,” “places,” “Places,” “Topics,” and “questions” are all interchangeable metaphors for what Bacon calls a “wise interrogating.” Bacon’s topographical configuration of the act of questioning might be said to reinforce the propriety--the propriety of place--of such questioning, and it is precisely this propriety that forges an important link with Kuhn. For as we see above, normal science is most effectively conducted only when the proper questions are placed at stake. It is part of the function of the paradigm to eliminate from the purview of the

normal scientist those questions that do not reflect the concerns and assumptions of the paradigm. Such propriety marks not only a manner of “wise interrogating,” as it were, for Kuhn, but indeed, “half a knowledge,” the first half of the way to knowledge, to paradigmatic knowledge production. And just as each question formulated within the confines of a particular paradigm leads the way to further refinement of it, so for Bacon it is also true that every discovery further enhances the scientists ability to make more discoveries--i.e., to ask “wiser” questions.

But this is not the only point of contact in evidence here. We notice that part of Bacon’s point in having the scientist ask the proper questions is precisely in order that, following Plato’s statement, the scientist may also have some relatively clear conception of what the answer to that question is. Now this is an even more fundamental constituent of Kuhn’s construction of the paradigm’s function in knowledge production as well. We might recall, for example, the definition of normal science cited earlier, especially the clause in which Kuhn suggests that the very function of normal science is precisely to “increase the extent of the match between those facts [discovered or explained by a paradigm] and the paradigm’s predictions” (24). This is a point that Kuhn will stress a number of times, later saying that “so general and close is the relation between qualitative paradigm and quantitative law that, since Galileo, such laws have often been correctly guessed with the aid of a paradigm years before apparatus could be designed for their experimental determination” (29). And again, “[e]ven the project whose goal is paradigm articulation does not aim at the *unexpected* novelty” (35--original emphasis).

9. Articulating the Paradigm Paradigm

So yet again, a fundamental aspect of Kuhn's most important contribution to the history of ideas/philosophy of science seems to have found its originary articulation in the very thinker whose project he is at specific pains to eject from the purview of his program. Yet even with this tellingly large number of confluences, we might still have articulated more--Bacon's suggestion, for example, that "there is nothing more new than an old thing that has ceased to fit"⁹¹ uncannily resembles Kuhn's description of the effects of anomaly on the process of paradigm change. Or again, Kuhn's discussion of the textbook transmission of knowledge, another key facet of his discussion of paradigm change, is mirrored by Bacon's deliberate re-conception of the "commonplace" in terms of what can only be called a kind of proto-textbook, complete with the rhetoric of efficiency that is so important to Kuhn's discussion. We have, by now, adequately demonstrated that Kuhn's seven indictments of Baconian method are countered by even more instances in which Bacon's text can be seen not only to outrightly contradict Kuhn's reading, but even to obtain in Kuhn's project itself.

What is to be inferred from all of this? For if we have expanded the points of contact between the two projects well beyond the possibilities suggested by Horton's reading, we have yet to give some sense of how it is possible that these two projects can be so deeply connected, and how it is that Kuhn could have failed to see these connections himself. Part of that failure, to dwell first on that aspect of our question, might be attributed to the differing epistemological environments that we have described earlier--Bacon and Kuhn were looking at different worlds. But this does not explain everything, nor is this a particularly satisfying answer, for we are still left with the

question--why are changes in world view figurable in terms of the paradigm only *after* Bacon's thought, when, at least according to Kuhn, the iterative relation between normal and revolutionary science starts to normalize itself, thus becoming identifiable by and with certain scientists, like Newton and Lavoisier? Would it not follow, then, that Bacon was not looking at the world, *a* world, at all?

The answer to these questions comes in an understanding of the objects of the respective projects. As we have noted in great detail, Bacon's overhaul of method was most properly construed by him to be a *theoretical* project--at stake in his project are the very grounds and enabling conditions of knowledge production, and the originary articulation, the invention in a sense, of the mechanisms--experience, experiment, induction, observation, etc.--by which this knowledge production is to be carried out. On this level, Bacon theorizes the possibility of an empiricism, rather than "being" an empiricist. Kuhn, on the other hand, does not have to invent a method of knowledge production--he need merely (as if any undertaking of such difficulty and importance could be described with a "mere") come to an understanding of those mechanisms and how they function. We might even say that if Bacon's is a theorization of empiricism--i.e., an articulation of its philosophical conditions of possibility--Kuhn's is a kind of empirical account of theory--i.e., the empirical theory of empirical knowledge production. There is, indeed, strong reason to believe that something like this is indeed the case. Consider what Kuhn does *not* target in *SSR*: he does not isolate the concepts of experiment and observation, those crucial figures of method that *do not change across paradigm shifts*. And they do not change because they are the very criteria against which

change is measured--as we have already seen, the entire question of articulating new knowledge with old tools/vocabularies, of the very possibility of the emergence of anomalous experimental results leading to paradigm change, *depends absolutely* on a constant and clear conception of what an experiment, or observation, is. Such things are almost too obvious to mention for us, but for Bacon, as we have demonstrated already, these were the ownmost site of his thinking and theorizing insofar as Bacon discerned a need for their determination and clarification. It is to Bacon that we are in large part indebted for the very concepts whose self-evidence causes our oblivion to their place in knowledge production, and especially as epistemological constants that invariably survive paradigm change, and indeed, *must* survive it if the very term "paradigm" is to be meaningful at all.

A shift in our own thinking is necessary here if we are to understand the connection between these two projects, one that exists in such startling detail not despite, but rather *because of* the surface differences in epistemological environments upon which we have briefly elaborated. Perez-Ramos might suggest, for example, that we have engaged in nothing short of an inflated edification of anachronism in dwelling in such detail on the points of contact between Baconian and Kuhnian thinking. Horton might suggest that we have in Bacon a privileged example of the efficacy of Kuhnian thought itself. Yet both approaches would depend on a particular historiographical turn that says that something other than, exterior to, the confluences themselves are responsible for determining their meaning, and their meaningfulness. I would suggest a different reading, and it is this--we cannot ask after what it is that accounts for these confluences, for in the

end, *they account purely and unequivocally for themselves*. It is not some model of history, or conception of historicity, that should justify our reading of the profound and remarkable similarity between projects--a similarity that must ultimately suggest that Kuhn's *Structure of Scientific Revolutions* is, more than anything else, a rewriting--at times verbatim--of Bacon's *The Advancement of Learning*. On the contrary, the confluences detailed here should open for us a way past the entrenched historiographical habits of Bacon's commentators that have done so much to breed the critical disdain of Bacon's theoretical work that seems so much in evidence in Bacon scholarship today. The sheer detail with which Bacon's project agrees, with what is to many the most important work in the history and philosophy of science of the twentieth century, asks that we think another possibility for the place of Bacon's thought, one that is able to name, in the first and final instances, the Baconianism that decisively determines the very essence of the scientific endeavour as we have come to know it to this very day. In this moment, finally, we are able to name the contemporaneity of Bacon's thought. Bacon's thought is, down to the last detail, our own.

Oracular Conclusion: A Second Glance At Bacon's Text¹

A text is not a text unless it hides from the first comer, from the first glance, the law of its composition and rules of its game. A text remains, moreover, forever imperceptible. Its laws and its rules are not, however, harbored in the inaccessibility of a secret; it is simply that they can never be booked, in the present, into anything that could rigorously be called a perception.

And hence, perpetually and essentially, they run the risk of being definitively lost. Who will ever know of such disappearances?

This project has been intended as a second glance at the so-called "scientific" thought of Francis Bacon. This "second glance" has been possible only insofar as Baconianism itself has, throughout this project, constituted the first glance from which the laws of Bacon's text have hidden themselves. If, notwithstanding our efforts in the preceding pages, such laws and rules must forever remain imperceptible, their traces have, I hope, emerged in some small degree not only through our use of Warminski's reading strategies to effect a look awry of the (necessarily?) disfiguring first glance of Baconianism, but perhaps even more profoundly (if not, indeed, ironically, because so literally) in our decision to find so close an association between the laws and rules of Bacon's scientific method, and the laws and rules of Kuhn's understanding of scientific revolution. For first of all, Warminski's theorizing helped us to discern the manner in which Bacon has been "booked" by Baconianism, prematurely perceived according to a set of assumptions that do much to make an intelligible Bacon, but do little to make Bacon intelligible. Bacon's text does not simply run the risk of disappearing; at crucial moments, it disappears in no

uncertain terms. To read Kuhn alongside Bacon, however, is to suggest that perhaps indeed, in those rare instances where a cluster of concepts seems not to change for, say, 350 years, it may be possible after all to learn something of that disappearance, and consequently to effect something like a return to origins, to visibility. Bacon's text for us, in other words, has not been *definitively* lost. Yet.

The dissimulation of the woven texture can in any case take centuries to undo its web: a web that envelops a web, undoing the web for centuries; reconstituting it too as an organism, indefinitely regenerating its own tissue behind the cutting trace, the decision of each reading. There is always a surprise in store for the anatomy or physiology of any criticism that might think it had mastered the game, surveyed all the threads at once, deluding itself, too, in wanting to look at the text without touching it, without laying a hand on the "object," without risking--which is the only chance of entering into the game, by getting a few fingers caught--the addition of some new thread.

If one of the many decisions behind our reading has been to present Bacon's text as the surprising source of an assault upon the very critical tradition that has for centuries claimed to know it, there can be no question that it has surprised us as well. In this regard, we must admit to having added something to that text, some other thread of meaning to which, for all we know, our readerly vision remains entirely blind. Indeed, Bacon's text, in being presented as a rejoinder to the criticism it has engendered, as well as having been read and interpreted outside of the Baconianism that has constructed it, has come to offer something entirely new about Bacon's text, a new web of meanings, not the least of which constitutes a glimpse of its contemporaneity. The work of understanding Bacon's thought today, for today, has only just begun with the various

¹ The blocks of italicized text that follow come from Jacques Derrida's opening to his long essay, "Plato's Pharmacy," found in *Dissemination* trans. Barbara Johnson. Chicago: Chicago UP, 1981. 63-64.

decisions of reading contained herein. We can say for certain, however, that we have attempted to “lay our hands” on Bacon’s text, to crack the book with which Bacon has been conflated for so long. Whether any text whatsoever is susceptible of such a laying on of hands must remain beyond us for the present time. But at the very least, we may consider the delusions of Baconianism adequately exposed, leaving for now our own delusions to be exposed by some other.

Adding, here, is nothing other than giving to read. One must manage to think this out: that it is not a question of embroidering upon a text, unless one considers that to know how to embroider still means to have the ability to follow a given thread. That is, if you follow me, the hidden thread. If reading and writing are one, as is easily thought these days, if reading is writing, this oneness designates neither undifferentiated confusion nor identity at perfect rest; the is that couples reading with writing must rip apart.

It has been our professed belief, based on the delusions of Baconianism, that Bacon’s text has been for some time now (and most especially, perhaps, in the twentieth century) unavailable to/for reading. And as our discussion of Warminski’s theory of reading and interpretation intimated, it has been our intention all along to simply suggest that there is a text to be read when discussing Bacon’s thought. As it has turned out, the “hidden thread” of Bacon’s thought may very well have been the text itself. It is vital that we be able to distinguish Bacon’s text from the Baconianism that has hidden it, and this not at all for the purpose of recuperating Bacon, so much as giving to read the texts that he wrote. To write not only upon Bacon’s text, but just as prominently upon the Baconianism that has configured it, has necessarily implied a reading of both, and vice versa. In following the stitch that has knotted Baconianism to its namesake, we have, in a sense, demonstrated the impossibility of its tenets and itinerary. Baconianism *as a*

reading/writing of Bacon has failed to read/write the text it sought, has produced a critical result that, under concerted scrutiny, tears asunder not only Bacon's text, but, most surprisingly of all, its own procedures.

One must then, in a single gesture, but doubled, read and write. And that person would have understood nothing of the game who, at this, would feel himself authorized merely to add on; that is, to add any old thing. He would add nothing; the seam wouldn't hold. Reciprocally, he who through "methodological prudence," "norms of objectivity," or "safeguards of knowledge" would refrain from committing anything of himself, would not read at all. The same foolishness, the same sterility, obtains in the "not serious" as in the "serious." The reading or writing supplement must be rigorously prescribed, but by the necessities of a game, by the logic of play, signs to which the system of all textual powers must be accorded and attuned.

The avulsion that we have signaled here, between Bacon and Baconianism, marks, in the end, the distinction between the necessity of Bacon's game with God, and the inability of Baconianism to recognize--to comprehend--the deadly seriousness of it. Bacon sought to make science a match for nature so that the game might go on; sought to reduce the importance of the theological to the scientific so that, ironically, no act of man could force a stoppage in play, in the game of hide and seek whose logic and necessities, unchanged since Bacon's articulation of them, still ground the search for knowledge today. For all we know.

Notes: Chapter One

¹ Francis Bacon. *The New Organon*. ed. Fulton H. Anderson. New York: Macmillan Publishing Company, 1960, 4. All References to the *Novum Organum* shall be to this edition, a reprint of the Ellis, Spedding, and Heath edition.

² I mean by “Baconianism” throughout this project the critical constructions of Bacon that have emerged over the last fifty years or so. While this may seem somewhat restrictive, and perhaps arbitrary, it is nevertheless the case that most Bacon commentary today can trace its provenance to various critical assessments of Bacon’s thought--negative and positive--that have been offered throughout the history of ideas since Bacon’s time. To be sure, Baconianism has had a long and fraught history--from the outright praise of members of the Royal Society like Glanville to the mewlingly insensate attacks of Joseph de Maistre--and our desire to address only the last fifty years of it is necessitated not only by the limited scope of this project, but more importantly by the particular emphases on the question of critical reading practices that this project means to foreground. The peculiarities of contemporary commentary on Bacon’s thought, upon which we shall be elaborating here, will, I think, justify our decision in this regard. For an excellent account of the “meanings of Baconianism,” see Perez-Ramos, *Idea*, 7-32.

³ Peter Urbach. *The Philosophy of Francis Bacon*. La Salle, Illinois: Open Court. 1987

⁴ Perez-Ramos makes this important point in *Idea*, Chapter II.

⁵ It is necessary to draw upon more than one theory of reading in this case because the misprisions of Bacon's critical history, as well as the very specificity of Bacon's text, does not allow us the luxury of a "read and apply" relationship to set theories of reading. I will show why, alone, neither Warminski's nor Fish's reading strategies are enough-- that one needs speak to the other in order for us to determine how it is that we can cast Bacon's thought in a new and illuminating light.

⁶ To bring the question of literary theory to Bacon's thought, as the work of Warminski (deeply indebted to the thought of Paul de Man) and Fish (a founder of reader-response theory) implies, demands a brief aside. Warminski cites a passage from Maurice Blanchot in which the necessity for a kind of "methodological good faith" must ground any so-called "book of elucidations." I feel it important to emphasize that what I offer here can be described as precisely that, i.e., an elucidation of Bacon's program. But what I feel this attempt at elucidation demands, in hermeneutical and exegetical terms, may seem to some an almost over-wrought, and needlessly complex, gesture to literary theory. This is not some attempt to fly in the face of the kind of historiographical scholarship that has traditionally oriented Bacon studies, though it will inevitably seem that way. Rather, what I hope will emerge here will be a useful new trajectory for our understanding of Bacon, one that, if critical of certain judgments and critical practices evinced in the study of Bacon, will be so in the very good faith of which Blanchot speaks, whether theoretically inflected or not. It is the perspicacity of Bacon scholarship that will come under interrogation here; not, generally speaking at least, its honesty (though comments like Thorndike's will certainly strain our composure in this regard). In this challenge will

emerge a new strategy for reading Bacon that does not easily fit with the styles of scholarship used to study Bacon today; but even if negatively so, the kinds of theoretical work to be done here will, by necessity, rely on the historiographical insights that it, at times, critiques.

⁷ A book about reading is never actually a book about reading, as Warminski suggests: “. . . both the subject and the method are “reading,” and yet “reading” can be neither subject nor method” (xxvii). At the same time, of course, any book that claims to read must simultaneously be about reading. It would take us too far afield to elaborate too closely upon this. What follows explains the different direction in which the stakes of our particular argument lead us.

⁸ If this seems to be a “counter-intuitive” manoeuvre to make, it is by no means an unfamiliar one. Not only is this familiar to us from Heidegger’s famous “treeness of a tree” example (in “The Question Concerning Technology,” (4)) from which we might suspect Warminski to have styled his own critique. It may well have been Bacon himself who first articulated this oblique style of phenomenological questioning. It is a fundamental tenet of Bacon’s thought that one cannot question the “thing” itself in order to determine its essence. We will later have cause to return to this important point in more detail.

⁹ In what follows, I will generally be omitting Warminski’s specific contextualization of his argument in terms of the work of Hölderlin, Hegel, and Heidegger, since, while they are certainly important for the direction of his own argument, they are not necessary to

the intelligibility of ours, nor to the intelligibility of his theoretical articulations upon which we shall here be extrapolating. (See pp. xxxi-xxxv)

¹⁰ But would it? We have already seen in an earlier note the degree to which Heidegger's interrogative model in "The Question Concerning Technology" has a certain provenance in the work of Bacon. Nor was it any accident at all, though this seems to be entirely forgotten, that Kant--the very harbinger of self-reflection as it would come to be understood by the likes of, say, Hegel, Heidegger, and Warminski--dedicated his first critique to Bacon. All of this would unfortunately take us beyond the purview of the limits set for this discussion. And of course, the very nature of the argument we are making about the reading of Bacon would disallow so presumptuous a genealogy. Still, and without meaning to pursue this point too deeply, it is worth inquiring as to the status of negation and negativity in, as well as the very "legibility" of, Bacon's text. The negativity that Warminski evokes is indistinguishable, in a way, from legibility itself, suggesting that insofar as Bacon's text is legible, it registers the absent presence of a certain negation, a Nothing. Might we not say that this Nothing drops out of sight because both the "nothing" and "great" camps are busy *interpreting* Bacon?

¹¹ One might want to suggest that, because Warminski deals with Hegel's and Heidegger's reading of Hölderlin, the Hegelian and Heideggerian texts serve the critical function of secondary texts in this particular case. I think it would be quite naive to think this. While we cannot go into detail concerning the question of what distinguishes a critic from a philosopher, I think there can be no question that the texts Warminski deals with are differently "charged" than the ones that constitute the Baconianism with which we are

here concerned. Warminski also has the pleasure of dealing with the most “philosophically rigorous” of readings; as some of the commentary that we have cited above shows, we are not quite so fortunate. It is, in fact, in the very difference between Warminski’s target texts and our own that his reading can be so helpful to us when it comes to addressing a Baconianism whose blindness can have to do, at times, precisely with the simple lack of attention to detail, or the willful neglect of the text. We must remember that Hegel and Heidegger, as philosophers and not critics, are not bound to a “correct” reading of Hölderlin, only a rigorous one, usually in the service of their particular philosophical positions. That rigour always demands concerted recourse to the text, no matter how it may, in the end (mis)represent it. In our case, however, the critic is indeed, in a certain sense, bound to a correct understanding of the text, since hers is not the work of unpacking an idea, but of an author’s ideas--the stakes are entirely different. When we fail to refer to the text, and instead make received wisdom the critical yardstick, then not only Bacon’s text, but criticism itself, comes dangerously close to disappearing. We might attack a critical position for either lacking rigour, or lacking truth--but when it lacks *both*, as I claim is the case with received understandings of Bacon’s text (i.e. Baconianism), something altogether different is at stake, and hence the distinction necessary between our work and Warminski’s.

If we were to unravel this rather dense issue in more detail, we might well start with Heidegger himself, who makes this provocative claim in the third volume of *Nietzsche*:

With the term *thinker* we name those exceptional human beings who are destined to think one single thought, a thought that is always “about” *beings as a whole*. Each thinker thinks only one *single* thought. It needs neither renown nor impact in order to gain dominance. In contrast, writers and researchers, as opposed to a thinker, “have” lots and lots of thoughts, that is, ideas that can be converted into much-prized “reality” and that are also evaluated solely in accord with this conversion capability. (*Neitzsche III*, 5--original emphasis)

Whatever we might say about Heidegger’s characterization here, one thing is certainly clear: the criticism with which we are dealing--i.e. Baconianism itself--seems to be modeled on this convertibility, that is, precisely in terms of the reification and phenomenological reduction of both Bacon’s thought, and Bacon the (historical) figure. It is this convertibility that orients and enables the many, often contradictory, conceptions of Bacon’s program. In contrast, I think it will become quite clear that Bacon really only had one idea (and it was not induction). It had neither renown, nor much particular impact while he lived, but it has come to dominate and determine the very limits of truth and knowledge for the last four hundred years.

¹² Some rather troubling examples exist to support this claim. We might take as just one instance an essay by W. M. Mcrae, (“The Paradigmatic and the Interpretive in Thomas Kuhn.” *Clio*, 17:3, 1988. 239-248) where Bacon’s thought, the avowed subject of a comparison with the work of Thomas Kuhn, is only directly referred to once. This complete and total lack of rigour attests to the strength with which we continue to cling to received conceptions of Bacon’s thought that even a cursory reading of his text would challenge. I will be making this point with more force later in the project.

¹³ For the sake of our own discussion of Bacon, I shall not delve here into the more radicalized implications of Warminski’s profoundly de Manian reading--i.e., the various

sorts of illegibilities, monstrosities, disfigurements and defacements that come with any attempt to read the language of one's reading outside of its philosophical determination, though to be sure, such teratological tropes are particularly efficacious in describing the impact that Baconianism, as we understand it here, has had on Bacon's text. Still, it is worth commenting on the relevance of a de Manian approach to a text's linguistic for our reading of it, and David L. Clark makes a very important connection for us in this regard:

De Man's radical position [i.e., concerning the "materiality of the letter"] would therefore seem monstrously unpalatable to literary critic and author alike. But readers miss exactly half of de Man's central insight if they conclude that in his hands deconstruction becomes merely destruction. It cannot be emphasized enough that for de Man reading is unavoidable to the precise degree that it is impossible. What saves his position from simply doing "literature a disservice by placing it in a realm remote from its physical, emotional, and moral contexts," as D.M.R. Bentley has said of critical theory, is that for de Man we have *no choice but* to locate literature in these and other contexts, since literary criticism, like all forms of reading, crucially relies upon them in order to ensure the legibility of the text. (284)

To extrapolate from Clark's comments, we can say that Baconianism has ensured, and *insured*, the legibility of Bacon's text precisely by avoiding reading it, and has located Bacon in an historical context not in order to understand him, but precisely in order to justify this avoidance, to sanction a legibility that we mean never to test. Our task here is to avoid this avoidance.

¹⁴ Vickers' article is important, to my mind, because of its clear yet impassioned articulation of the pernicious lack of good faith that tends to characterize the various "jaunty" dismissals of Bacon's thought that still persist. His attack on Jonathan Marwil's

flawed reading of Bacon is particularly telling. See Marwil's *The Trials of Counsel: Francis Bacon in 1621*. Detroit, 1976.

¹⁵ Again, I reiterate that it is not that we place some sort of epistemological faith in the accuracy of the text itself--it is the *lack* of accuracy that burdens Baconianism that must be got around, and the best way to do this is simply to read the text under study. This embarrassingly obvious point, as we shall proceed to show, has been by no means obvious to generations of Bacon scholarship. Baconianism has not just swerved from Bacon's text--its seems, all too often, to have thrown it away entirely.

¹⁶ This critical move--to discuss one of Bacon's concepts by citing a passage that is not particularly germane, and ignoring those that are--marks another symptom of the pathology that afflicts Baconianism in general.

¹⁷ In other words, what often at first appears to be a reading of the history of science that is based on refuting some notion of Bacon's thought turns out, when Bacon's text is actually cracked, to repeat--sometimes literally--Bacon's own thinking. Peter Urbach has convincingly demonstrated this precise situation in his article, "Francis Bacon as Precursor to Popper." As we ourselves shall demonstrate shortly, the same "formalism" that we have demonstrated exists in Whitehead's approach to Bacon can be discerned in the relation between Kuhn's and Bacon's texts as well. For essential reasons, the stakes of that relationship are even greater, a point of which we shall return.

¹⁸ Infact, Bacon thought quite the opposite: "But for that going to and fro to remote and heterogeneous instances by which axioms are tried as in the fire, the intellect is altogether

slow and unfit, unless it be forced thereto by severe laws and overruling authority” (NO, 51) By authority, however, Bacon was speaking to the question of method.

¹⁹ Popper suggests that this doctrine of manifest truth “though often accepted implicitly,” has not to his knowledge “been explicitly discussed or even noticed by philosophers or historians” (7). Quite the contrary, of course, is true—the question of manifest truth, known more properly to us now as the question of “presence,” has been at the centre of philosophical inquiry since the Greeks; I would argue that it is a central point of critique for Bacon as well. Unfortunately for Popper, his knowledge is necessarily incomplete due to his reticence to read some of the more important philosophers of his own age. This reticence stems from the fact that they, like Whitehead (perhaps more than Whitehead), were for him “irrationalists,” and not only resistant to critical rationalism, but by necessity depraved. Popper’s dismissal of Heidegger, for example, in *Open Society*, constitutes the very source of ignorance that Popper claimed to be resisting. Heidegger is a “nihilist;” the “basic categories” of Heidegger’s thought are “Fear; the fear of nothingness; the anguish of death. . .” and Popper makes sure to quote Schopenhauer on Hegel in order to give us his opinion of Heidegger’s work without having, in the end, to have read it in good faith: “Should you ever intend to dull the wits of a young man and to incapacitate his brains for any kind of thought whatever, then you cannot do better than give him Hegel to read” (77). Popper decides that, instead of reading what is admittedly difficult material, he will take cheap shots instead. The point here is that Heidegger could not have been called a nihilist, or attributed the ideas above, if Popper had taken the time to read them. Thus we see that Popper’s position concerning “critical rationalism” is

undone not simply by his ignorance but by his intellectual practices concerning those realms of thought about which he knows very little. Had he taken time to read the Heideggerian text, for example, he might have noticed that the doctrine of manifest truth (“presence”) was a fundamental concern for Heidegger’s re-elaboration of the question of Being in *Being and Time*. Popper’s obsession with a rationalism that lacks any reflexivity as concerns the question of reason might have learned something from one of Heidegger’s important later texts, *The Principle of Reason*.

²⁰ To clarify: Bacon is associated with the authority of the senses, while Descartes with that of intellectual intuition. Both involve recourse, for Popper, to an epistemological optimism.

²¹ His vicious dismissal of Whitehead’s *Process and Reality* culminates with these final words “[. . .] I can only look with repugnance and even with something like hate upon the puffed-up pretentiousness of all these volumes filled with wisdom, such as are fashionable nowadays” (*Society*, 250).

²² See his very interesting article, “Francis Bacon as a Precursor to Popper,” *Brit. J. Phil. Sci.* 33 (1982), 113-132.

²³ Fish, Stanley. *Self-Consuming Artifacts: The Experience of Seventeenth-Century Literature*. Los Angeles: California UP, 1972. Fish has been criticized in his reading of the *Essays* by Eugene Garver and David Posner for failing to take into account the *Essays*’ ethical implications suggested by their nominal titles. What Garver and Posner fail to realize, however, is that for Fish, it is the ethics of reading itself that is at stake, over and against the putatively moral or ethical subjects of the *Essays*. It is for this reason

that Fish notes that, in many cases, the *Essays* are not at all about the various subjects for which they are named. See Eugene Garver. "Saying What Goes Without Saying: The Rhetoric of Bacon's Essays." in Frederick J. Antczak, ed. *Rhetoric and Pluralism: Legacies of Wayne Booth*. Columbus: Ohio State UP, 1995, 218; David M. Posner. *The Performance of Nobility in Early Modern European Literature*. Cambridge: Cambridge UP, 1999, 83.

²⁴ Joseph Summers also notes the strange tendency of Fish's analysis of others to remain unaware of its implications for itself. See his "Stanley Fish's Reading of Seventeenth-Century Literature." *Modern Language Quarterly*. 1974 35, 416.

²⁵ Fish takes this passage from the Spedding edition of the *Collected Works*, VI, 397. I will proceed to reproduce in detail Fish's reading of this passage so that its contrast to his characterization of Bacon's scientific program can be made more clear.

²⁶ Of course, this would be the perfect place to revisit Warminski's "third" step, the point at which reading becomes and betokens an allegory of itself. Again, however, we maintain our engagement with the specificity of Bacon's text, and so leave this question for another day. The point to be made, nevertheless, is that Warminski's conception of the allegory of reading is eminently applicable not just to understanding a given text, but perhaps more properly obtains in a concerted questioning of the various critical formalisms that now characterize our engagement with the text, literary, scientific, philosophical, or otherwise.

²⁷ At times, remarkably disturbing contradictions emerge. Witness, for example, Charles Whitney's convoluted description of the "Baconian scientist":

[T]he Baconian scientist stands as a supreme consciousness with potential dominion over all nature and all philosophy, depending entirely on his own judgment rather than on traditional natural philosophy. This stance is justified, however, through a rigorous discipline that produces childlike innocence, with the mind essentially reduced to a mere organ of reception, and 'equal mirror.' Thus true natural history requires men 'to approach with humility and veneration, to unroll the volume of creation, to linger and meditate therein, and with minds washed clean from opinions to study it in purity and integrity" (233)

Two points stand out: 1) Whitney does not recognize the contradiction between his description of the scientist-- "a supreme consciousness"-- and Bacon's attempt "to approach [nature] with humility and reverence," an approach that Bacon reiterates a number of times throughout his project, as we shall soon demonstrate. 2) Bacon never describes the mind as a "equal mirror," and never maintains that it could become this--if it is true that he hoped to "wash it clean from opinions," this does not imply, as Whitney seems to think it does, an innocent (why this e-valuative adjective?) mind, since if we can overcome the prejudices of other's opinions, Bacon is still careful to note that we shall never ultimately overcome our own. Hence the very *raison d'être* for his articulation of a method. Ultimately, for Bacon, the mind is *never* a "mere" organ of perception, for it never ceases to interpret what it receives. I will elaborate more fully upon this in the next chapter.

²⁸ Soper's arguments, in this regard, coincide with the pervasive critique of Bacon's thought by prominent feminists working today in science studies. For similar interpretations of Bacon's conception of nature, see Sandra Harding, *Science*; Evelyn Fox Keller, *Reflections*; Carolyn Merchant, *Nature*. Alan Soble's "In Defense of Bacon" critiques these authors' understanding of Bacon's figuring of nature. Despite some

important insights, his misogynistic rhetoric (quite brutal at times) only serves to demonstrate the necessity for the work of the authors he critiques.

²⁹ For just a few of many examples from within the confines of Bacon commentary itself, see James Roy King. *Studies in Six 17thC Writers*. Athens, Ohio: Ohio UP, 1966, 6; Charles Whitney. "Bacon and Herbert: Bacon and Herbert as Moderns." in Edmund Miller and Robert DiYanni eds. *Like Season 'd Timber: New Essays on George Herbert*. New York: Peter Lang, 1987, 233; José María Rodríguez García. "Solitude and Procreation in Francis Bacon's Scientific Writings--The Spanish Connection." *Comparative Literature Studies* 35.3 1998, 281-2; Julie Robin Solomon. "'To Know, To Fly, To Conjure': Situating Baconian Science at the Juncture of Early Modern Modes of Reading." *Renaissance Quarterly*. 44:3, 1991, 530.

There is more at stake in critiquing these misunderstandings of Bacon's thought than one may realize. To take this received, if inaccurate, understanding of Bacon's conception of nature for granted leads to some disastrous, not to mention insensitive, critico-political positions. Witness Joshua Scodel's justification for preferring masculine pronouns in the discussion of Bacon: "'I use masculine rather than gender neutral terms because Bacon conceives of human mastery as the masculine domination of a feminine, 'passive' nature" (89, note 1). When a mistake about the contents of Bacon's text on so important an issue as the sexualization of knowledge becomes justification for reproducing that mistake, it is time that such tactics be exposed as the pernicious effects of a failed reading that they are. The point is not that one should use gender-neutral and even feminine pronouns when discussing Bacon's work--such attempts would ultimately

seem incongruous, and even gratuitous. Rather, one should not try to justify one's own politics concerning Bacon's thought by appealing to a Baconian position that, however universally received, does not exist. See Scodel's "'Mediocrities' and 'Extremities'": Francis Bacon and the Aristotelian Mean." David Quint et. al., ed. *Creative Imagination: New Essays on Renaissance Literature in Honour of Thomas Greene*. Binghampton: Medieval & Renaissance Texts & Studies, 1992.

³⁰ On those rare occasions when the complexity of Bacon's rhetorical relationship to nature is acknowledged, it is usually stripped of its theoretical importance. We shall see an example of this in a moment.

³¹ Laudis K. D. Kristof, G. L. Ulmen also note that Marx establishes a direct link with Bacon on the question of materialism. They, however, make the important point that "the more distant and relative the affinity to dialectical materialism the more uncritical the eulogy tends to be[. . .]" (234). See their "Francis Bacon and the Marxists: Faith in the Glorious Future of Mankind." in Ulmen, ed. *Society and History: Essays in Honour of Karl August Wittfogel*. The Hague: Mouton, 1978. 233-257.

³² I will be returning to this point in more detail in a moment. The fact that Book I and Book II of the *Novum* represent entirely different intellectual trajectories has not received the kind of attention that it requires. Here is not the place to give it that attention, but for now, we might say that Book I can be thought of in terms of its theoretical positioning of Bacon's project, and Book II in terms of Bacon's experimental practice.

³³ Bacon is particularly tenacious about this point over many years. In his latin translation of the *Advancement*, the *De Augmentis*, he will again include this sentiment: ". . .so it

cannot be found strange if no further progress has been made in the discovery and advancement of the arts, when the art itself of discovery and invention has as yet been passed over” (500). It is precisely this “art of discovery”--what Bacon calls the “Interpretation of Nature,” that shall consume our inquiries in the next chapter of this project.

³⁴ cp. *Advancement*: “But leaving the humour which hath reigned too much in the schools, which is, to be vainly subtle in a few things which are within their command, and to reject the rest; I do receive particular Topics (that is, places or directions of invention and inquiry in every particular knowledge) as things of great use, being mixtures of Logic with the matter of the sciences; for in these it holdeth, *ars inveniendi adolescit cum inventis*” (129).

³⁵ Thus, claims like Salim Rashid’s--from yet another context (i.e. political economy)--that “the most important aspect of Bacon’s message was his proclamation that utility was the best guide to truth” (245), when cast alongside Bacon’s text, inevitably expose themselves for the misprisions that they are.

³⁶ We shall save our elaboration of this question for the following section concerning religion.

³⁷ See, for example, footnotes 33 and 34 above.

³⁸ One of most pervasive, and pernicious, mistakes to be made when thinking the question of the difference between theory and practice is to imply, even if negatively, that the two are mutually exclusive. Such a distinction must maintain, impossibly, that practice--utility itself--cannot be theorized, and this point has becomes something of an

enabling condition for the reception of Bacon's thought over the last 400 or so years. As it has been made clear above, Bacon's utilitarianism offers not just an ethos of practicality, but *implacably* refers itself to the very *theory* of utility. To privilege one over the other is to limit oneself to understanding only half of Bacon's project—which is to say, none of it. Our reading of "Nature," then, can be said to exemplify the consequences of ignoring the doubleness of Bacon's thinking.

³⁹ Nowhere is this more forcefully articulated than in Bacon's famous figuration of scientific inquiry as a kind of "hide-and-seek" with God, where Bacon describes this game in terms of a seeking after that which God has deliberately hidden. Distinguishing scientific inquiry from the problematic curiosity that gave rise to the fall, Bacon writes: "Whereas of the sciences which regard nature, the divine philosopher declares that 'it is the glory of God to conceal a thing, but it is the glory of the King to find a thing out.' Even as though the divine nature took pleasure in the innocent and kindly sport of children playing at hide-and-seek, and vouchsafed his kindness and goodness to admit the human spirit for his playfellow at that game" (*Novum*, 15).

⁴⁰In this latter regard, see the deeply problematic, because so profoundly literalist, readings of Cameron Wybrow in *The Bible, Baconianism, and Mastery over Nature: The Old Testament and its Modern Misreading*, and David J. Hawkin, "The Disenchantment of Nature and Christianity's 'Burden of Guilt.'"

⁴¹ See his "Bacon's Science and Religion" in *The Cambridge Companion to Bacon*. As we shall see, Briggs himself believes religion to be the guiding force of Bacon's project.

⁴² For others who support this view, see Harvey S. Weiner (85-92), and Benjamin Milner (245-264).

⁴³ As Barbara J. Shapiro notes, “Although Francis Bacon, the outstanding spokesman of English science, has been claimed for the Puritans, there is not much profit in so labeling this intensely secular mind. He was as unsympathetic to the quibblings of the theologians of his own time as to those of the scholastics, and his advocacy of a moderate policy toward the Puritans may be attributed to his distaste for persecution rather than to puritan sympathies. Bacon, like the majority of later scientists, made it clear that ‘controversies of religion’ could only ‘hinder the advancement of science.’” (58-59) See also Timothy Paterson, “Christianity,” 419-442.

⁴⁴ We shall take up this question in more detail in the third chapter.

⁴⁵ Timothy Paterson makes precisely this point in “Orpheus,” 438-439.

⁴⁶ For example, the following from Aphorism 89:

Others with more subtlety surmise and reflect that if second causes are unknown everything can more readily be referred to the divine hand and rod, a point in which they think religion greatly concerned--which is in fact nothing else but to seek to gratify God with a lie. And others again appear apprehensive that in the investigation of nature something may be found to subvert or at least shake the authority of religion, especially with the unlearned. But these two last fears seem to me to savour utterly of carnal wisdom; as if men in the recesses and secret thought of their hearts doubted and distrusted the strength of religion and the empire of faith over the sense. . . (88)

We shall return to this question of the relation between faith and sense in a moment. For now, it is enough to say that moments like this are not unfrequent throughout Bacon’s text. Their meaning is what we shall address below.

⁴⁷ It is crucial to understand that while Bacon only speaks of “experience” in the passage I cite above, we would notice in a larger context that what Bacon has done here is conflate experience and experiment. The paragraph from which I have taken this passage begins, “And even when they seek to educe some science or theory from their experiments. . .” and proceeds to switch, entirely seamlessly, to the word experience. The importance of this conflation, gone largely unnoticed by most commentary, must be left for another time. What we can say here, for the moment, is that experiment does seem to imply its cognate (or indeed, the fact that experience and experiment *are* cognates), especially in the suggestion from the passage that “we must likewise from experience of every kind first endeavour to discover true causes and axioms;” here, experience is used in an entirely unfamiliar way, one that seems to mimic contemporary understanding of the concept of experiment.

⁴⁸ To suggest that there are two ways to conceive the rhetorical function of the word “fruit” in Bacon’s thought should not be considered without precedent. When it comes to Bacon’s articulation of his scientific program, key philosophemes are often “doubled” in this way. We might note, for example, that Bacon speaks of two kinds of induction, two kinds of interpretation, two kinds of experiment, two kinds of anticipation, two kinds of logic, etc. This penchant for doubling the labour of certain key words, still largely unexplored, provides for us the path into a more comprehensive understanding of the theoretical stakes of Bacon’s thought. This rather interesting point will have to be left aside for now.

Notes: Chapter Two

⁴⁹ Horton is not the only critic to dismiss Book I in this way, and to take Book II as the primary site of inquiry for Bacon has become so obvious for most commentators as to make Horton's self-conscious positioning seem unnecessary. The emphasis on Book II is especially strong when discussing induction. For just a few of many examples, see Virgil K. Whitaker, "Doctrine," (209-216); Marice B. McNamee, "Grammar," (81-107); Michael Hattaway, "Broken," (183-197). Marie Boas Hall goes so far as to suggest that "one reason for the unsatisfactory nature of the *Novum Organum* is that it is primarily a treatise on logic, all of whose examples [i.e. the Prerogative Instances of Book II] are ostensibly developed to show the method; but Bacon was so much more interested in the examples--all involving the exploration of nature--that he developed them too fully for the demands of logic, and not fully enough for them to stand alone. . ." (439) L. Jonathan Cohen extends Hall's misunderstanding of the *Novum* as a treatise on logic, suggesting that "the terms 'induction,' 'inductive,' etc., are best confined to a logical or quasi-logical sense, as the analogy with 'deduction,' 'deductive,' etc. suggests. Keynes long ago remarked that the importance of Bacon and Mill, in relation to induction, lay in the contribution to its logic, not in their view about the methodology of scientific discovery" (63-64). Douglas Bush makes similar remarks in *English Literature*, (279).

⁵⁰ It is important to keep in mind that part of what motivates Horton's desire to avoid the "propagandism" of Book I is the fact that commentary dating back as far as the late nineteenth century had come to the conclusion that Bacon's *only* contribution to modern logical and scientific thought was his "persuasiveness." James Roy King writes, for

example, that “[t]he force of what Bacon had to say about the possibilities of science came not from his scientific knowledge, which was limited and inaccurate, but from the tremendous personal enthusiasm which he projected to others” (222). And as Basil Willey once put it, “Bacon’s great service to ‘science’ was that he gave it an incomparable advertisement, by associating with it his personal prestige, his “Elizabethan” glamour, and his great literary power. The feeling of “rightness” with which English and other scientists proceeded in succeeding centuries must have been due, in part, to his persuasiveness” (34). While avoiding Book I is not, ultimately, the answer to this bizarre pocket of critical reflections, one can nevertheless appreciate Horton’s tactics.

⁵¹ We shall return to the importance of the question of “progress” in our discussion of the relation between Kuhn’s and Bacon’s work.

⁵² Had we the time, we might liken Bacon’s thinking to certain intellectual movements in literary theory that have gained popularity in recent years. Bacon’s “demolition as reconstruction” is not far removed, and perhaps can even be said to foreshadow in some way, the “deconstruction as reconstruction” that has become so prominent in both literary criticism and theory.

⁵³ We must notice here that Bacon’s conception of progress, and the one generally in use today, are not the quite the same. That is to say, in order for Bacon to be able to use progress as a trope capable of contributing to the reinvention of scientific knowledge production, he must similarly reinvent the concept of progress itself. For Bacon, progress is by no means a linear concept, and in fact, it is precisely its linearity, usually figured in

terms of a concept of “improvement,” that Bacon replaces with an iterative conception meant to speak not simply to the production of discoveries, but most properly to the abstracted category of discovery itself.

⁵⁴While Levin’s gesture to Freud seems incongruous here, it is only fair to point out that Levin is, at this point in his paper, attempting to sustain an argument on the similarities between Freudian and Baconian conceptions of imagination. Nevertheless, his gloss not only misses the highly nuanced conception of fact that Bacon uses, but simply replaces one “ornate” usage with another; indeed, to replace Bacon’s rhetoric with the jargon of Freudian psychoanalysis would seem to me to be at odds with Levin’s implied attempt to make Bacon’s thought more intelligible to the “modern” reader.

⁵⁵ It is something of a testament to the uncritical manner in which criticism has absorbed a certain construction of Bacon that Nadelman’s essay, though ostensibly about the relationship between Bacon and Peirce, never once cites Bacon’s text meaningfully, and relies instead on Peirce’s reading of Bacon, one that sounds more like the ravings of a distraught Joseph de Maistre than the most important American semiotician of the nineteenth century. Peirce: “. . .superior as Lord Bacon’s conception is to earlier notions, a modern reader who is not in awe of his grandiloquence is chiefly struck by the inadequacy of his scientific procedure. That we have only to make some crude experiments, to draw up briefs of the results in certain blank forms, to go through these by rule, checking off everything disproved and setting down the alternatives, and that thus in a few years physical science would be finished up--what an idea” (Nadelman, 91). It is worth mentioning that Nadelman’s reticence to read Bacon’s text is not an isolated

incident, and in fact seems to emerge fairly often in critical situations where Bacon is being compared to a contemporary thinker. See, for example, Murdo William McRae, 239-248. McRae is loathe to cite from Bacon's text, and prefers to reproduce received wisdom. Our treatment of Kuhn and Bacon later on will offer an entirely different viewpoint.

⁵⁶ It is worth remembering our earlier discussion of Bacon's own account of the relation between empiricism and rationalism, where he suggests that, in resisting the privileging of either school of thought, he means to "[establish] forever a true and lawful marriage between the empirical and rational faculty. . ." (14). My suggestion is that this union de-emphasizes the prevalence of these approaches to knowledge production in favour of a theory that combines them.

⁵⁷ Paul Feyerabend, in *Against Method*, makes a similar point concerning the notion of scientific facts. He writes: "The history of science, after all, does not just consist of facts and conclusions drawn from facts. It also contains ideas, interpretations of facts, problems created by conflicting interpretations, mistakes, and so on. On closer analysis we even find that science knows no 'bare facts' at all but that the 'facts' that enter our knowledge are already viewed in a certain way and are, therefore, essentially ideational" (11). I might prefer to replace, in the present context, "ideational" with "theoretical." At any rate, we must be willing to consider that Bacon was not only capable of understanding the impossibility of the existence of "brute facts" (attributed to him by Popper), but that he was largely responsible for the move away from such an empiricism.

⁵⁸ As we shall see, it is precisely in construing the “mean and insignificant” according to what they both critique and valorize about a theoretical approach to them that helps to constitute the “new foundations” of scientific inquiry.

⁵⁹ Nisbet’s suggestion that Herder looked to Bacon as the theorist of the empirical bears important implications for our argument which shall become clearer in due course.

Nevertheless, there is a clear association here with the “theory” of empiricism with the concrete, a configuration that has entirely different nuances in Bacon’s text.

⁶⁰ We shall see some even more compelling evidence for such a reading when we undertake, in due course, to discuss Bacon’s concept of experiment, and particularly the importance and range of the figure of “fruit.”

⁶¹The complexity of Bacon’s thinking concerning experiment, and its relation to experience, necessitates a more singular treatment which I shall take up in due course.

⁶² See, for example, R.F. Jones. “The Bacon of the Seventeenth Century.” rpt. in Brian Vickers, ed. *Essential Articles for the Study of Francis Bacon*. Hamden, Conn.: Archon 1968. 7; Virgil K. Whitaker. “Francis Bacon’s Intellectual Milieu.” ed. Vickers, 29; John Steadman. “Beyond Hercules: Bacon and the Scientist as Hero.” *Studies in the Literary Imagination*. 4.1, 1971, 25; Samuel I. Mintz. “The Motion of Thought: Intellectual and Philosophical Backgrounds.” *The Age of Milton: Backgrounds to Seventeenth-Century Literature*. ed. C.A. Patrides and Raymond B. Waddington. Manchester: Manchester UP, 154.

⁶³ Perez-Ramos’s enlightening thesis concerning Bacon’s grounding in a “maker’s knowledge tradition” would, in the case of our reading, still need to be referred to the

presuppositions that make such maker's knowledge possible. It is to these presuppositions, rather than the epistemological model of maker's knowledge per se, to which I would suggest Bacon's project most properly refers itself. Much has to do with the manner in which "invention" and "discovery" are conflated by Bacon in order to announce a shift in the epistemological assumptions that ground the production of knowledge. It is to this discussion which we now return.

⁶⁴ And to be sure, it would not be recognized as a concern by rationalists of our own day either. Feyerabend's biting assessment of Popper's critique of Bacon is most germane. Not understanding the *theoretical* grounds for Bacon's rejection of Copernican theory--grounds which have nothing to do with the "truth" of the matter, Popper writes that Bacon "sneered at those who denied the self-evident truth that the sun and the stars rotated round the earth, which was obviously at rest. . ." (16) Feyerabend, recognizing Popper's pernicious reading, writes in a note to chapter 11 of *Against Method*:

Science-loving philosophers, including those who call themselves 'critical,' are quick to criticize thinkers who do not share their pet ideas. Bacon was often criticized for not at once falling for Copernicus. He was criticized for this unspeakable crime by philosophers whose own 'rationalism' would never have allowed Copernicus to live. (113)

Popper's liberalism somehow rings hollow after this.

⁶⁵ There is a very close affinity here between Aristotle's "affections" and Bacon's "notions"--to see it, we must recall an obsolete definition of notion, in which it is conceived as "a character, relation, form, etc., in which anything is conceived, mentioned, or exists." (OED)

⁶⁶ Martin Elsky has maintained that Bacon disseminated an Aristotelian view of language in which “words have no existence other than as signs pointing to their referents in the world” (452). But as Bacon’s discussion of the word “humid” points out, the question of the relation of language to things, especially when we proceed beyond the realm of the proper noun to the impropriety of the metaphor, is far more murky. Writes Bacon,

Let us take for example such a word as *humid* and see how far the several things which the word is used to signify *agree with each other*, and we shall find the word humid to be nothing else than a mark loosely and confusedly applied to denote a variety of actions which will not bear to be reduced to any constant meaning” (57--second emphasis mine).

For Bacon, it is not that words become separate from things--they are conjoined to *too many* things. It seems clear that Bacon is far better understood to be looking forward to, let us say, Saussure, than looking back to Aristotle.

⁶⁷ For just two of many possible examples, see Roger Pooley, 221; R.E. Probst, 579.

⁶⁸ Karl Wallace was not really that far off in calling Bacon’s new understanding of induction a “psychology of discovery,” but we must emphasize in this phrase the concept of discovery moreso than that of psychology. See his *Bacon on the Nature of Man*, 6.

⁶⁹ When this passage is gestured to in the context of a discussion of induction, its deeply complex meaning is never unravelled. See for example, Wiley, 67.

⁷⁰ It is important to note that Bacon distinguishes the form of induction he articulates here from “the induction of which the logicians speak, which proceeds by simple enumeration [and] is a peurile thing. . .” (20). Here, Nisbet (274), Nadelman (89), and Jardine (85), among others, are wrong to conclude that Bacon adheres to a “simple induction”--this was the very form of induction he sought to refute. As Simonds notes--a point made all

too rarely-- “Bacon’s originality as a methodologist lay in his recognition that the traditional notion of inductive reasoning by what he calls “simple enumeration,” that is, generalizing from a number of particular observed instances of some characteristic or process, is inadequate as a foundation for the sciences” (500).

⁷¹ See, for example, Pooley: “[Bacon] sees the value of instruments, though, with his usual mathematical blind spot, does not stress their ability to give precise numerical values” (221). Kuhn’s discussion of the emergence of “Baconian” experimental apparatus also depends on viewing Bacon primarily as an instrumentalist. See *Tension*, (41-45).

⁷² As much as we want to resist casting Bacon in any sort of “prophetic” light in terms of his contribution to the history of ideas, it is nevertheless worth noting the strong resemblance that Bacon’s conception of experiment and “the question” bears to Martin Heidegger’s discussion of the question in his introduction to *Being and Time*. As it is for Heidegger, so too is it the case for Bacon that the question *itself* must be construed a crucial guiding tropic for any question concerning anything whatsoever.

⁷³ Charles Whitney. “Allegorical.” This position is quite literally a dogma of Bacon studies. For other examples, see, Morrison (590); Hattaway, (197); John F. Tinkler, (255). Some notable exceptions, in which it is suggested that Bacon’s conception of natural history demands to be conceived according to some theoretical ground, include Sachiko Kusukawa, (53); Michel Malherbe, (82).

⁷⁴ We should remember, however, that Bacon never rejects the syllogism as a *pedagogical* tool, and in fact recommends it as such.

⁷⁵ J.E. Tiles has written, in a very illuminating article, that

the shift to an experimental outlook did require a change in the way people conceived nature; not however a shift in the way they thought of its constituents, nor a shift in the forms of explanation which they sought, but a shift in the attitude which they took to the epistemological value of what met the eye. Nature came to be regarded as having hidden depths, not necessarily depths to be plumbed by techniques of micro-observation (although this idea figured prominently) but depths of unrealized potential which needed the manipulation of phenomena, the “vexations of art” to bring to the surface of actuality. (468)

Tiles makes an important point here, but it still depends ultimately on a view of Bacon’s conception of nature that emphasizes, too heavily as I have suggested earlier, its coercive and violent configurations. As I go on to suggest here, another reading is possible.

⁷⁶ It is worth pointing out that this reading depends absolutely on taking Bacon’s comments here “in context.” While this passage on Bacon’s “vexing” of nature has become a staple of a commentary concerned to cast Bacon in a utilitarian/empirical light, the fact remains that his passage is universally decontextualized. Part of what it means to re-read this particular passage, then, involves not only placing it within its proper context—that is, Bacon’s pointed discussion of natural history—but it also demands, furthermore, that we contextualize this context, i.e., natural history itself must be understood in terms of the Interpretation of Nature to which it is meant to refer. In a sense, we are literally re-membering a project that has been dismembered by a nearly uniform reticence to read its texts of origin.

⁷⁷ One cannot help refer to Bacon’s biting assessment of the research methods of the mechanics, in which barnyard animals, among a host of other things, are seen to exhibit more theoretical commitment in their intuitive and instinctive behaviours than even the best of experimental assays by humanity. As he writes, in the *De Augmentis*:

Moreover they who have written about the first inventors of things or the origins of sciences have celebrated chance rather than art, and represented brute beasts, quadrupeds, birds, fishes, serpents, as the doctors of sciences, rather than men. . .So that it is no marvel (the manner of antiquity being to consecrate inventors of useful things) that the ancient Egyptians (to whom very many of the arts owe their origin) had so few human idols in their temples, but almost all brute. . .So that in the invention of arts it would seem that hitherto men are rather beholden to a wild goat for surgery, to a nightingale for music, to the ibis for clysters, to the pot lid that flew open for artillery, and in a word to chance, or anything else, rather than to Logic. (501-502)

Bacon is, of course, relying in many cases on myth to bolster his point that arts invent us more often than we invent them. It is precisely this notion that Bacon hopes to reverse.

⁷⁸ As, for example, Jardine (1974), Perez-Ramos (1988), and Solomon (1990) have done, just to name a select few.

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⁷⁹ See Urbach, (113-132).

⁸⁰ Part of why Perez-Ramos does this, I think, may have to do with Kuhn's disparaging comments concerning Bacon's program--it may simply have been Perez-Ramos's intention to remove from consideration a description of Bacon's program that is, in obvious ways as we shall see, entirely inaccurate. Still, this leads to some problematic historiographical questions, and makes it very difficult for us to see past Kuhn's blindnesses. We shall, obviously enough, be suggesting a different way of dealing with this problem.

⁸¹ The question may legitimately be asked, however, as to whether or not such methods in treating Bacon have become a function of themselves. It seems to me too facile a move to simply relegate Bacon to a conception of history that is either unwilling or unable to

conceive the transhistorical implications of his project. It is precisely to the overturning of such a decision concerning Bacon's text that we shall turn shortly.

⁸² See for example the *Novum Organum*:

But my course and method, as I have often clearly stated and would wish to state again, is this--not to extract works from works or experiments from experiments (as an empiric), but from works and experiments to extract causes and axioms, and again from those causes and axioms new works and experiments, as a legitimate interpreter of nature" (107).

Incidentally, it is precisely this iterative movement that names what Kuhn will call the "destructive--constructive" [deconstructive??] movements of paradigm change.

⁸³ There is a crucial sense in which this is quite true, and necessarily so. However, Bacon's "pre-paradigmaticity" reflects, not a form of ignorance, but his position as the augur of the very possibility of the paradigm itself.

⁸⁴ In his "Postscript," Kuhn uses the example of the formula for Newton's Second Law of Motion, $f=ma$ [force=mass x acceleration]. In a Newtonian paradigm, few will disagree with the efficacy or meaning of the formula. But the manner in which it can be applied when faced with different phenomena (i.e.--free fall vs. the motion of a pendulum) can always mark a point of debate. See Kuhn, (188). Kuhn's particular metaphor for the paradigm as a map that indicates new directions for map making bears a very strong resemblance to the manner in which we saw Bacon figuring the iterative movements of knowledge in note five above.

⁸⁵ It may seem strange to saddle Kuhn with the Baconian rhetoric of progression and advancement, especially given his (Kuhn's) avowed resistance to a linear conception of scientific progress. Yet the fact remains that it is precisely this rhetoric that suffuses

Kuhn's project, particularly in his discussions of "normal" science. There are points, however, when this rhetoric leaks into the concerns of his larger (counter)historiographical project as well, leaving a sense of progress imbued within the fabric of his theorizing on paradigm shift--his discussions of the "efficiency" of textbook learning is a particularly important example. We shall encounter this in more detail in a moment.

⁸⁶ As Kuhn remarks, the instigators of either paradigm decay or new paradigms themselves are often the product of different research traditions entirely: "Any new interpretation of nature, whether a discovery or a theory, emerges first in the mind of one or a few individuals. It is they who first learn to see science and the world differently, and their ability to make the transition is facilitated by two circumstances that are not common to most other members of their profession. Invariably, their attention has been intensely concentrated upon the crisis-provoking problems; usually, in addition, they are men so young or so new to the crisis-ridden field that practice has committed them less deeply than most of their contemporaries to the world view and rules determined by the old paradigm" (144).

⁸⁷ Too little attention has been given to the fact that Kuhn's articulation of paradigmatic thinking is not the only one. We can discern, for example, in Husserl ("Origin of Geometry") and Heidegger (*Being and Time*) both, to name just two exemplary figures, a conception of scientific activity that would be largely commensurate with Kuhn's thinking. The necessity to historicize the existence of the (ahistorically conceived)

paradigm may provide even further (though not entirely necessary) sanction of the primacy of Bacon's thought on this matter. This project is, however, beyond us here.

⁸⁸ The adjective *placitus*, cognate of the verb *placere*--to be pleased or satisfied--infers a belief or principle that has been agreed upon in advance to the satisfaction of a particular community.

⁸⁹ A brief gesture to the *Novum Organum* demonstrates the similarity with which Bacon and Kuhn conceive the sort of "conversion experience" of which Kuhn writes. As Bacon says, "Of myself I say nothing; but in behalf of the business which is in hand I entreat men to believe that it is not an opinion to be held but a work to be done" (16). These words by Bacon, concerned specifically with the epistemological shift in the conception of scientific knowledge that he feels is necessary to understanding his project, clearly demonstrate an effort not simply to convince, but to convert, while at the same time remaining uncompromising about the position being taken.

⁹⁰ Again, we have another of those remarkable confluences with Martin Heidegger's thought that, unfortunately, we do not have the time or space to discuss. See his "Introduction" to *Being and Time*.

⁹¹ "Quod tempore antiquum videtur, id incongruitate est maxime novum" (Advancement, 139). While this is a pejorative context here, it nevertheless articulates a conception of what we might now call "anomaly" that is pervasively implied throughout Bacon's project.

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