

## Epistemological and Methodological Foundations

Understood literally, *method-ology* means the study and/or use of methods. This understanding implies the existence of more than one method and that the utility of a particular method can vary across contexts. For many practitioners in political science, the method of choice is determined by the number of observations: Students of relatively abundant political phenomena rely on statistical techniques, students of unique political phenomena use case study techniques, and those in the middle sample choose from a wide array of qualitative or small-*N* comparative approaches. This methodological rule of thumb is derived from an implicit hierarchy of methods, which is the product of a particular, and very influential, research tradition.

This entry examines the ontological and epistemological foundations of this research tradition to explain the reasoning behind its implicit hierarchy of methods and to show some of its inherent limitations. There are two objectives for this. The first objective is to broaden the reader's methodological horizons by showing how one's choice of methods should reflect the nature of the subject one studies as well as the way in which one can acquire knowledge about that subject. By examining these methodological foundations, political scientists can become more aware of both the potential and the shortcomings of the methods they use. Just as important, methodological reflection can encourage political scientists to use a broader range of methods. In recognizing how the usefulness of any particular method will depend on the nature of the subject under study as well as on the mode of explanation that the analyst deems most appropriate, political scientists may find it necessary to adapt their methods, or adopt new ones, as the nature of the political world (and political scientists' interest in it) evolves.

To stimulate this sort of reflection, this entry focuses on the philosophical underpinnings of the most common approaches. For empirically minded political scientists, these philosophical concerns are twofold: (1) they need to be aware of the nature of the things they study, and (2) they need to concern themselves with the various means by which they can secure reliable knowledge about those things. These two concerns provide the basic framework for this entry. The first section examines the way in which mainstream approaches depend on a particular understanding of the political world to produce the theories and generalizations that the political science profession admires. The most common methods are designed to exploit specific ontological contexts and epistemological standards; as a result, they do not always work as designed when transplanted to new and different contexts. The second section introduces an alternative ontological approach and its relationship to the same, commonplace methods. In short, the relationship among ontology, epistemology, and the methods is discussed in the first two sections that follow. The third section examines some of the most common difficulties facing researchers who are trying to secure reliable knowledge about that political world. In their attempt to secure and understand knowledge about the world, they inevitably impose their own ways of ordering it. Recognizing and correcting these inherent biases is the subject of the third section, which harks back to Francis Bacon for the task.

### The Political World

Political science—as an academic discipline—has grown out of several fields, which vary significantly from one national tradition to the next. In some contexts, the weight of history has been strongest; in others, politics grew from the study of law; in still others, economics or philosophy were the host communities. As a result, modern political science can draw from a very deep methodological well, if only one is willing to tap into it. Throughout most of the history of European political thought, one can find a remarkable diversity and openness about how to address political affairs. The founding thinkers of the political science discipline—Plato and his student Aristotle—could not agree about the nature of the world they studied, the utility of different sources of knowledge about that world, or on any particular method for studying that world. After all, Plato was not especially interested in experience or empirical detail; he emphasized the importance of reason in discovering

truths about an ideal world. Aristotle, by contrast, favored a more down-to-earth approach, where observation of events in the world and careful comparisons could show us true from false.

In these foundational thinkers, one can find an open discussion about the importance of linking the approach of study to the world of study. In the centuries since, there has been a broad consensus that the nature of the social and political world is relatively similar to that of the natural world. Indeed, this consensus is one reason why many methods developed for studying the natural world have successfully migrated to the social sciences, and it may be an important reason why political scientists spend so little time discussing ontological issues. As will be seen in the next section, this is not the only ontological perspective embraced by political scientists—but it remains the most dominant. Most political scientists view the political world in a way that is strongly influenced by a long and illustrious tradition in the natural sciences. This tradition builds on two important assumptions. The first holds that the phenomena studied are independent of the observer, so that observations do not affect them in any significant way. In this tradition, political scientists can approach their world of study confident that there is an objective subject of study—a Real World—and that this subject will reveal itself consistently to each observer. Because the Real World exists independent of us, and because that World is stable and unchanging, it is possible to arrive at singular truths about the nature of this Real World, given the appropriate techniques.

The second common assumption holds that this Real World is patterned—that it obeys a certain logic of its own—and that these patterns are also independent of their observers. Because these patterns are a natural part of the world, this can be called a *naturalist* ontology, perspective, or world-view. While some of these patterns are patently obvious (e.g., heavy items, when dropped, fall to the ground; the sun rises in the east and sets in the west), others are concealed by the complexities of nature and life. The latter is especially true in the political world. It is the fixed existence and independent nature of these underlying patterns that allows us to generalize about the nature of social relationships. In recognizing these fundamental components of this ontology, researchers have developed methods that can search for, uncover, and eventually explain the systematic patterns that they believe exist but that are often hidden from the casual observer.

Belief in the existence of these natural and stable patterns can explain the predominance of two main sources of knowledge in political science: reason and experience (or sensory perception). These are not the only sources of knowledge available to political scientists, nor are they exclusive to the naturalist's world view. Still, rationalism and empiricism remain political scientists' most common and dominant sources of knowledge. The first of these, rational knowledge, acquires understanding about the world through strict adherence to rigorous thinking (e.g., by using syllogisms or formal logic). Because we believe the world to be stable and patterned, we can use reason and logic to uncover the underlying form, ideal, or model on which the Real World is based. While the original motivation for this way of interpreting the world was religious (that an all-powerful God created the world and imbued it with meaning), it enjoys a long and august pedigree: one that extends from Plato, through 17th-century continental European philosophy (e.g., Descartes, Spinoza, and Leibniz), and continues today in mathematical and/or rational choice approaches to studying the political world.

In the rationalist tradition, the patterned nature of the Real World can be uncovered and understood by creating consistent and logical models to show how the world really is beneath the confusing complexity of everyday life. By filtering out the particular irregularities of experience and by focusing on the underlying concepts and relationships, rationalist approaches are able to create pristine models of social behavior. Thus, for example, economists can generate models of what a true market, in equilibrium, should look and behave like (e.g., in the absence of organized interests and government regulations). Similarly, social choice theorists can show (under a number of very reasonable conditions) that no voting system is fair.

Implicitly, the authors of these models believe that they correspond to the true nature of the (underlying) Real World. To complicate matters, this Real World might differ from the world of experience. When models do not actually correspond to observable actions or patterns, supporters can argue (like Plato) that the particular experiences of everyday life (or our description of these experiences) get in the way of, or obscure, our perception of the underlying patterns and relationships. Consequently, the standard of proof in this tradition tends to be reason, not a reference to how things actually are in the world of everyday experience.

The second main source of knowledge—empiricist knowledge—is arguably the most dominant in contemporary political science. The power of this type of knowledge is derived from the belief that the most secure means of obtaining knowledge about the world is through sensory perception and the clear description of these sensory experiences. Although it may be harmful to depict the history of science in simple—dichotomous—terms, it is common and convenient to depict the empiricist tradition as a response to—or in dialogue with—the rationalist

tradition. Thus, Aristotle is seen to have reacted to Plato's rationalism in beginning his treatise on *Politics* with the simple claim that "observation shows us," and British philosophers such as Francis Bacon, John Locke, and David Hume are said to be responding to the continental philosophers associated with the rationalist tradition.

Here, too, the messiness of everyday life can cloud the underlying patterns:

The universe to the eye of the human understanding is framed like a labyrinth, presenting as it does on every side so many ambiguities of way, such deceitful resemblances of objects and signs, natures so irregular in their lines and so knotted and entangled. And then the way is still to be made by the uncertain light of the sense, sometimes shining out, sometimes clouded over, through the woods of experience and particulars; while those who offer themselves for guides are (as was said) themselves also puzzled, and increase the number of errors and wanderers. (Bacon, 1620/1863a, Preface)

Although the true patterns of a Real World lie hidden in this labyrinth of experience, empiricists believe that the use of appropriate methods and careful study can uncover them and reveal the truth. Following Karl Popper, naturalists in the empiricist tradition believe that a statement is true if it accurately corresponds to a state of affairs in the Real World.

For the world of political science, as for the world of nature (or perhaps even more so), the complexity of overlapping vocabularies and perspectives can make it very difficult to see the underlying and stable patterns that make up the Real World. To uncover these patterns, researchers must choose their approaches carefully and dissect the world systematically. Modern empiricist approaches draw from the "experimental methods" in John Stuart Mill's (1891) *A System of Logic* to develop inductive approaches that can identify the lawlike relationship in the underlying (political) world. Modern political science—in all its variants—is remarkably indebted to Mill's methods of experimentation. His method of difference, method of agreement, indirect method of difference, and method of concomitant variation have become the building blocks of modern comparative and statistical analyses: tools that are used to systematically control and compare our experiences of the political world in ways that allow us to discover the stable connections and causal regularities that are hidden beneath the surface.

Both these mainstream sources of knowledge (rationalism and empiricism) assume that the Real World not only exists but that it is naturally structured or patterned in a logical, meaningful way. Methods that rest atop both rationalist and empiricist foundations are designed to uncover singular truths about the nature of the Real World and to do so in an objective, disinterested manner. It is this pattern (or logic) that allows us to use systematic tools of induction (or methods of experimentation, to use Mill's terms) to tease out the patterns that lie just beneath the surface or to generate logical and rational models of how the world *actually is*. In this mainstream (naturalist) tradition, political scientists can transcend their personal, temporal, and cultural perspectives, and beliefs and prejudices, to arrive at valid knowledge and objective truths.

Most contemporary political scientists have inherited approaches that have grown out of this tradition: They have found utility and meaning in methods that have been carefully adapted in ways that make them more suitable for studying the political world. Indeed, scholars in this tradition subscribe to a strong (if implicit) hierarchy of methods for uncovering truths about the world, and they do so by combining elements from both the rationalist and empiricist traditions.

At the top of this hierarchy lies the experimental method. This method is prized because it allows researchers to manipulate the relevant variables, in a context that controls for all other sources of influence, in order to secure firm knowledge about posited relationships. This method works because we assume the world to be made up of discrete and independent parts (not unlike those in a clock), which can be mixed and matched in different ways to reveal (and test) causal relationships. Indeed, this capacity to control and compare components of the real world is a hallmark of all good science.

When experimentation is not a realistic alternative—and many areas of political life do not lend themselves to experimental design—naturalists tend toward statistical approaches. Here too, manipulation, comparison, and control are central to uncovering real-world patterns. But instead of manipulating the contexts in which these variables lie, the statistician's computer manipulates the data in ways that mimic experimental control. Because statistics do not involve the physical manipulation of data, it is a method that lends itself to the study of social phenomena, where the tendency is to study events that have already occurred.

The naturalist's third best alternative is small-*N* comparative approaches. These are used when one is interested in questions that have too few observations to run reliable statistical enquiries. As both statistical and small-*N* comparative methods use experimental designs, they share much in common. The most important difference is that the comparativist selects the cases of study in a strategic way, so as to maximize the variance of the independent variables and to minimize the influence of other (control) variables. In other words, unlike statistical and experimental designs, case selection in small-*N* comparative projects is anything but random. Because of this, researchers need to rely on theory to avoid major problems associated with this method and its control strategy (such as over-determination and a sampling bias).

Finally, case studies constitute the bottom rung of this methods hierarchy. This method is used only when researchers are faced with a paucity of data or relevant comparisons. Case studies are histories with a point: They gather information on cases that are interesting or relevant in light of a larger theoretical concern or a specific research design. By collecting more data on such cases, researchers might eventually bump the study up to a higher rung on the hierarchy. On their own, however, case studies have little value, in that studying a single case can provide little grounds for generalization about the patterns that motivate the research.

These methods work remarkably well when used in the right contexts and when the limitations of each are recognized and respected. These contexts draw on a naturalist ontology that sees the world as something independent of the observer, patterned in nature, and accessible by methods that use observation, control, and comparison. The methods depend on a world that can be broken down into its component parts (variables), which are themselves independent and autonomous. This allows the researcher to cut up a political phenomenon, manipulate its component parts, and use this structured manipulation (of either the world or the data) to interrogate the phenomenon in a way that will reveal its logic or pattern. However, when these methods are used in a methodologically naïve manner—when they are used in contexts that do not correspond to the assumptions that gird them—the results can be misleading, biased, and wrong.

### **A Few Examples**

There is little point in humiliating those who have ignored the ontological assumptions that underlie their methods. This problem is common enough for the shame to be shared by many. Still, this point can be made with reference to a couple of recent (positive) examples of colleagues who have reflected on (and responded to) the shortcomings of a particularly popular method. Although both these examples are critical of cross-national regression analyses, it is not meant to suggest that this problem is confined to statistical studies. These examples are used because they highlight the sort of difficulties that can be found, even among the most refined, explicit, and sophisticated of contemporary methods. A fundamental assumption of most comparative research is that a representative sample of independent observations, drawn from the population of interest, is used. The independence of observations is important as it affects the effective number of observations (e.g., if there are four people in a household and they generate an opinion together, the number of independent opinions is one not four). Samples based on observations that are not independent will generate findings that misestimate the amount of variability in the population, producing biased sample statistics and erroneous conclusions. This assumption of (observational) independence meshes well with the ontological assumptions girding many of the fields of research that use regression techniques. When applied on international samples, this assumption is also in tune with the logic of the Westphalian state system (at least an idealized view of that system), where states are understood to be autonomous and independent. But in a world that is increasingly characterized by international integration and diffusion, this assumption is increasingly tenuous.

This problem is nothing new, and it is usually traced back to the critical comments of Sir Francis Galton, who—late in the 19th century—questioned the results of a paper that used data from a cross-cultural sample to test the relationship between marriage laws and descent patterns in tribal cultures. “Galton's problem” was born when he noted that the observed correlation might have been a result of contacts between the cultures in the sample (and not the result of a test of truly independent cases). While anthropologists have been struggling with Galton's problem for some time, political scientists have been remarkably slow to realize (and address) the problem. In recent years, however, there has been an explosion of activity on this front, as many statisticians attempt to deal with the effects of globalization. Detlef Jahn (2006) provides political scientists with a good introduction to the nature of the problem and suggests one way to try to deal with it. In an honest attempt to align method and ontology, Jahn proposes a simple modification of ordinary least-squares (OLS) regression techniques that allow him to measure the strength of the diffusion associated with globalization.

This is one way to resolve the growing tension between a changing world and the most popular method for its study. Jahn provides us with a “patch” to an approach that is not particularly well suited for dealing with the

changing world of international politics. These sorts of patches work if they are few in number and do not overwhelm the underlying approach (the result, then, would be like trying to run Windows XP on an old 386 processor). In the long run, it is likely that an approach that is better designed, from the bottom up, will need to be developed to deal with this new context. In the meantime, however, Jahn gets us thinking.

A second example comes from an article by Peter Hall (2008). Like Jahn, Hall is critical of mainstream regression techniques but for different reasons. His concern is not so much in the changing nature of the things researchers study but on the different kinds of things they study. In particular, Hall is interested in how researchers secure causal explanations of political phenomena. More to the point, Hall is critical of the (common) assumption that large-*N* statistical approaches provide the best grounds for causal inference. After reviewing three different modes of explanation (historically specific, multivariate, and theory oriented) Hall shows how small-*N* comparative designs can be valuable for causal inference. In particular, an intensive examination of the causal chain provides researchers with a new and different basis for causal inference—one that is especially well suited for assessing the sort of complex causal theories that are so prominent in the social sciences. When they use *systematic process analyses* (Hall's term), small-*N* comparisons can be especially useful for developing theory-oriented explanations.

Hall's reasoning rests on ontological foundations. In addition to traditional arguments (such as the need to be aware of the state of the literature), Hall notes how the researcher's methodology should be conditioned on the state of the world, as he or she perceives it (Hall, 2008; see also Hall, 2003). Because standard regression models build on assumptions that are unlikely to hold in situations where researchers are trying to develop theory-oriented explanations, he questions the (common) claim that a single (statistical) method can adequately assess the validity of causal inferences in the social sciences. While the underlying assumptions of standard regression analyses

were usefully employed to assess the conditions conducive to securing stable democracy, when those conditions were thought to include basic socioeconomic factors, such as the level of economic development, related levels of literacy and the correlates of “modernisation” ... when theorists began to see stable democracy as the product of an intricate strategic interaction among reforms, extremists and defenders of the old regime, statistical methods were no longer appropriate for assessing the causal chain. (Hall, 2008, p. 307)

Both these examples show how greater awareness of ontological assumptions should be important for empirically minded political scientists. In the first example, this sort of awareness was used to tweak an existing approach in a way that makes more sense in a changed (and changing) world of study. In the second example, explicit reflection on the different types of causal arguments was used to argue for the inclusion of small-*N* methods, more suitable for some of the tasks at hand. Both examples illustrate the importance of embracing different methods and thinking carefully about how our methods engage the world we study.

## Competing Worldviews

As with just about everything else in political science, there is more than one way to look at the political world. Indeed, there are many who are unwilling to commit to a single Real World of political study, and this has important consequences for the way that methods (even familiar methods) are used. While the focus of this entry is based on mainstream, naturalist approaches to political science, it can be useful to glance at an alternative ontological perspective to show how standard methods play different roles when used in different contexts.

This alternative ontological perspective can be called *constructivism*. Its followers question the existence of a single world of study, independent of its examiner and capable of revealing objective and singular truths. Instead, constructivists believe that truth lies in the eyes of the observer and in the constellation of power and forces that support that truth. As our observations and descriptions of events cannot be shielded from the biases that surround us, constructivists do not believe that it is possible to secure an absolute truth that corresponds to a single Real World. Their objectives are more modest: They point to the ways in which our contexts (and those of our subject matter) frame the way we come to develop an understanding.

This constructivist tradition is often marginalized by mainstream political science for being unreliable and even serendipitous. Some think mainstream political science does so at its own peril. This is because constructivism shares a number of ontological and epistemological features with the naturalist tradition, and these similarities allow each tradition to borrow from the other. In some respects, the two perspectives can complement one another, and the lessons learned from one tradition can be amended, or modified, to be applied in contexts more

familiar to the other. Indeed, this useful collaboration is evident in the growing movement for scientific realism. Most important, constructivists and naturalists share a willingness to see the world in terms of interpretable patterns, and both traditions rely heavily on rationalist and empiricist sources of knowledge for understanding these patterns.

How these perspectives differ is in their view of the source of these patterns and the ends to which they use rationalist and empiricist sources of knowledge. For constructivists, the patterns of interest are not firmly rooted in nature, but they are the products of our making: Each of us sees and experiences different things, and what we see (or experience) is determined by a complicated mix of social and contextual influences and/or presuppositions.

The modern intellectual roots of this tradition can be traced to Immanuel Kant, who was struggling with the implication of David Hume's difficulty in securing firm knowledge about causality. Hume's approach to causation rested on a rather simple theory of sensory perception: The human mind (straightforwardly, even mechanistically) absorbs impressions through the senses. Kant seems to have appreciated Hume's general theory of sensory perception, but he did not think that the human mind should be understood as an empty vessel into which sensory perceptions were merely dumped. For Kant, our senses only bring perceptions to the doorstep of the mind. It was then up to the mind to reorganize, characterize, and then store these perceptions for later use. To perform this task, Kant believed that the human mind was prewired with basic preconditioning concepts, or forms of understanding. Thus, in thinking about how we experience and store sense perceptions, Kant shifted the ontological terrain of patterned (lawlike) behavior from nature to the human mind. In other words, Kant believed that the patterns we see in nature are the result of our mental manipulation of sensory perceptions—not a characteristic of nature itself.

Kant did not suggest that the social world was ontologically different from the natural world. Neither did he question the existence of a Real World. Rather, Kant argued that we cannot know anything about the Real World (*noumena*, in his vocabulary). All we can know is that our perceptions (*phenomena*) of the Real World are somehow related to it—and that the nature of this relationship is complex and ambiguous. The result of this complex and ambiguous process is that scientists (both natural and social) find themselves facing what appear to be different, even competing, worlds.

There are several other reasons to question the naturalist ontology. Many of these responses emphasize the unique qualities of human agency to argue that the nature of human relations must be different from those that we find in the natural world. “We are cultural beings, endowed with the capacity and the will to take a deliberate attitude toward the world and to lend it significance” (Weber, 1949, p. 81). Constructivists take observations such as these to show how human agency, itself, can create objects that have a different ontological status than those found in the natural world: where the very existence of social facts (e.g., money, property rights, and sovereignty) depends on human agreement and institutions. Given this different ontological context, constructivists question the utility of employing methods to search for naturally occurring (independent) patterns of behavior.

Because constructivists embrace a world that is ontologically diverse and complex, they tend to draw on more and different types of evidence and proof. While constructivists draw heavily on rationalist and empiricist sources of knowledge, they are often willing to employ other, more radical, sources of knowledge as well (including, e.g., empathy, revelation, and myths). While these alternative sources of knowledge may be less reliable, they are firmly anchored in human experience. For this reason, they can provide important keys for unlocking the (constructed) patterns researchers study. As constructivists are not searching for objective and verifiable patterns of phenomena existing naturally in the social world, they do not subscribe to the naturalist's hierarchy of methods. After all, this tradition doesn't believe that truth is just “out there”; knowledge about the social world is always knowledge in context; it is socially situated and it has social consequences. While it is difficult to argue that constructivists subscribe to an explicit methods' hierarchy of their own, they clearly prioritize methods that protect and nurture the contexts that can explain the source of the patterns they see. As these patterns are understood to be socially (or individually) constructed, their methods aim to uncover the motivations and presuppositions that generate the underlying patterns.

For this reason, constructivists have a soft spot for narrative approaches, as these provide researchers with a nearness to the data and context that is necessary and desirable in order to gain insight. This emphasis on narration and the importance of context and contingency is extended to the way in which constructivists employ comparisons—as a tool for developing associations that can help establish meaning. While constructivists

seldom use statistical and experimental approaches, there is nothing inherent to either of these methods that need alienate constructivist scholars. With a little thought and imagination (two traits usually embraced by constructivists), statistical and experimental approaches could be designed and used in ways that can exploit contextual familiarity and appeal to constructivists. In short, constructivists tend to use the same basic methods, but they do so in different ways, toward different objectives.

In a nutshell, naturalists tend to exhibit little regard for the surrounding context. Their methods are designed to cut into contexts in order to gain access to the component parts. These are then manipulated to control for, and capture, relevant variation. Because the patterns they seek are assumed to exist independently of the component agents and their observers, preserving the interpretive context is not a high priority for naturalists. Constructivists, on the other hand, want to use comparisons to better understand the nature or source of these patterns. As the patterns they see are a function of the agents they study, or the observers themselves, familiar methods are often turned inside out to look critically at how the contexts themselves provide meaning to the patterns under study.

As in the naturalist tradition, constructivists can draw from an impressive intellectual legacy, which stretches back to antiquity. More surprising, perhaps, is that this perspective finds support among some rather unlikely allies. For example, this entry has already noted how indebted mainstream (naturalist) political science is to the experimental methods developed by J. S. Mill. What was not mentioned previously was that Mill himself (e.g., Mill, 2002) was skeptical of their application to the world of politics, and his skepticism rested on ontological foundations.

This sort of skepticism has been voiced by many others. Indeed, these shaky ontological foundations may be the reason why political science knowledge doesn't measure up (in terms of, say, the ability to generalize and/or predict) to the knowledge produced in the other branches of (natural) science. While such failures might be explained by other factors (e.g., the youth of the discipline, the complexity of human action), there are formidable arguments—authored by reputable thinkers such as Wilhelm Dilthey, John Stuart Mill, Martin Heidegger, Jürgen Habermas, and Charles Taylor—for believing that the shortcomings of this discipline are the result of relying on methods that rest on faulty ontological assumptions.

These sorts of challenges are important, if only because they force political scientists to consider ontological alternatives. The very existence, and growing popularity, of these alternatives should encourage political scientists to consider the degree to which their approaches and methods rely on assumptions about the nature of the real world. After all, if the political world is not really as political scientists assume—if its patterns are not constant, universal, and independent of us—then the workhorse methods they have developed will lose much of their pull.

## **Overcoming Bias**

The previous two sections argued for the importance of thinking carefully about the nature of the political world researchers study and how that nature affects the way they can and should study political phenomena. This section sets aside these larger ontological issues and narrows the focus to the most common approaches in contemporary political science: approaches that assume a naturalist ontology and rely on empiricist sources of knowledge. But even here, in this familiar ontological and epistemological context, political scientists face a number of important obstacles that can stand in the way of securing objective truths about the world they study. Overcoming these obstacles is another role to consider when choosing a particular method or methods.

While there are many ways to think about the practice of securing unbiased and true knowledge from the Real World, most of them draw from a common and distinguished intellectual legacy. This section highlights the contribution of a foundational thinker in that legacy: Francis Bacon. Bacon's approach to studying the political world is similar to that of contemporary political science: It begins by assuming that there is a real world out there and that it is possible to obtain true knowledge about that world. Also, Bacon was not particularly troubled by the possibility that our senses might deceive us (or any of the other arguments advanced by those who are skeptical of our ability to secure truth). Rather, Bacon was concerned with unmasking the underlying sources of misconception, irrationality, and error that bar us from reaching the truth. He seems to have believed that any impediment to knowledge could be overcome by the careful and considered means of dealing with the subtleties of nature:

The mind of man is far from the nature of a clear and equal glass, wherein the beams of things should reflect according to their true incidence; nay, it is rather like an enchanted glass, full of superstition and imposture, if it not be delivered and reduced [corrected]. (Bacon, 1605, Book 2, chap 14, p. 9)

To deliver and reduce this enchanted glass, Bacon provided us with a typology for thinking about the most common hindrances to seeing truth. In *Novum Organum* (1620/1863b), Bacon introduces the idols of the mind that had hitherto blocked the progress of mankind's knowledge of nature. For Bacon, these idols are like deceitful pictures—they are images that stand in the way of our grasping the truth, even though they may be grounded in human reason. Together, these idols capture the range of mental, psychological, and social dispositions that Bacon believed were responsible for distortion and error. The first of these are the *idols of the tribe*. These idols are intellectual errors that result from our common (i.e., human) weaknesses. For example, Bacon tells us that we tend to assume more order and regularity in the world than is actually the case; we have a soft spot for common sense—that is, we rely on limited assumptions without trying to verify them as established truths; we tenaciously hold on to our beliefs by means of continual rationalization, even in the face of countervailing evidence; we are attracted to positive examples more than to negative examples; we pursue wishful thinking (i.e., we believe what we want to believe); and we have a tendency to overgeneralize and to believe in ultimate causes.

In short, Bacon's idols of the tribe refer to our tendency to project our own (human) patterns of instinctive thinking onto nature. This tendency has not died with Bacon, nor has it been permanently corrected by subsequent methodological developments. Indeed, these idols can be seen at the forefront of all the social sciences. For example, the idols of the tribe might be used to explain why political scientists search for (and find!) the democratic peace, why economists find it fruitful to borrow the concept and mathematics of “energy” from 19th-century physics and apply it to the concept of utility, and why social science journals do not appear to be interested in publishing negative findings (and why it has been so difficult to launch a journal of negative results in the social sciences). More to the point, these idols may explain our willingness to assume that nature is constant, independent, and patterned, even in the absence of an almighty God that was once said to have made it so. Bacon himself would have political scientists continually question the underlying ontological assumptions of their discipline—not because those assumptions are unique to their discipline but because those assumptions might reflect a deeper, human need for a world that is constant and patterned, as if designed by a god.

This entry is not suggesting that the democratic peace, neoclassical economics, or all of the positive examples in professional journals are either false or illusive. (Nor does this entry intend to argue for—or against—the existence of God.) The point, like Bacon's, is more modest: Researchers need to be extra diligent and skeptical when they discover anthropocentric patterns and arrive at convenient truths.

The second category of Bacon's idols concerns those of the cave. *Idols of the cave* represent the peculiarities of each individual's temperament and limitations. These individual biases can include, for example, tendencies toward insularity, conservatism, or novelty; acceptance of authoritative propositions; or a willingness to bypass intellectually difficult positions. While the idols of the tribe are derived from the human condition, the idols of the cave reflect one's own individual biases. These biases are particularly difficult to shed, as they are derived from (and forged in) individual experience. But they are biases, nonetheless. Consider how practitioners of political science often become beholden to a particular method. As methods become more specialized and technical, this sort of method's monogamy is increasingly common. This specialization is, in itself, a welcome development, as a division of specialized labor can boost productivity and the quality of its research. In doing so, however, political scientists reverse the way in which scientists have traditionally understood the relationship between the world, the methods, and the understanding. Rather than let the nature of the question determine the proper method and means of understanding, we see the world as we would have it from the comfort of our cave.

This method's monogamy can have serious consequences for the way we come to interpret and understand the world. Political scientists may remember their own training in regression techniques and how exciting (and challenging) it was to interpret the world anew in terms of dependent and independent variables. This new perspective can be liberating, but it is also blinkered: “Someone with a new hammer thinks the world as a nail.” As with the idols of the tribe, Bacon teaches us that it is possible to overcome idols of the cave by being aware of our individual biases and confronting them directly in a critical, balanced, and clear way. It is for this reason (rather than a need for a clear demarcation principle) that researchers should strive to falsify their findings.

The next two types of idols are not so easily corrected. Bacon's third category, the *idols of the marketplace*, is derived from the shortcomings of language and intercourse, as words often betray their own purpose and obscure

the very thoughts they are designed to express. At the most general level, Bacon's idols of the marketplace contain two types of misunderstandings. First, we often give confusing, even ill-defined, names to things that do exist. After all, the world is full of meaningless words, words with double meanings, personalized meanings, jargon, and so on. Second, names are sometimes given to unreal things (e.g., Fortune, Prime Mover). While the first type of errors is difficult to eliminate, as they are deep-seated and quite complicated, Bacon believed that the latter errors can be easily thrown out along with the theories that inform them.

Most social scientists are aware of the slippery and inaccurate ways in which language and concepts can be used in the social sciences. Consider, for example, the different ways in which “significance” is often used in statistical papers or the varied and overlapping ways that political scientists refer to democracy, political parties, globalization, or even justice. As Émile Durkheim noted,

In the present state of knowledge, we cannot be certain of the exact nature of the state, of sovereignty, political liberty, democracy, socialism, communism, etc. Our methods should, then, require our avoidance of all use of these concepts so long as they have not been scientifically established. And yet the words which express them recur constantly in the discussions of sociologists [and political scientists]. They are freely employed with great assurance, as though they correspond to things well known and precisely defined, where as they awake in us nothing but confused ideas, a tangle of impressions, prejudices and emotions. (Durkheim, 1895/1964, pp. 65–66)

The fourth and final of Bacon's categories contains the *idols of the theater*. These are idols derived from things learned in the past, on the basis of poorly conceived experiments and superstitions. This makes them particularly difficult to avoid or overcome, as false learnings—when cultivated—gain wide influence and become unquestioned by their followers. It is because of this that Bacon dedicated most energy to deal with these idols, criticizing the habits of earlier philosophers and their approaches.

Presently, the political world (and its most influential actors) has begun to recognize the idolatry of a once dominant model of political and economic exchange. The idea of a self-regulating, equilibrating marketplace—one that could usefully and peacefully coexist within democratic polities—had become ingrained in the minds of men and is supported by the sort of poorly conceived experiments and superstitions to which Bacon referred. As the curtain appears to be falling on this idol of the theater, political scientists will have to rely on new understandings of the political world—understandings that are more aware of their debt to the “various dogmas of philosophy” and the “wrong laws of demonstration.”

For Bacon, these idols did not challenge his underlying (naturalist) ontology. Rather, he sought to undermine the authority of accepted sources of knowledge; he wanted to point out the pitfalls that lie along our path to more useful knowledge, as only then do we have a chance of avoiding them. Bacon believed that the mind of man is like a circus mirror; it reflects what is going on in the world, but it distorts it in the process. As a result, our mind produces false images or idols. While the mind will always create these false images, Bacon believed that it was possible to compensate for the distortion by building a correcting lens. Broad-based methodological reflection provides that lens.

## Conclusion

Bacon's *Novum Organum* is divided into two books. The first book introduces the idols of the human mind, to show the sort of obstacles, biases, prejudices, and limitations of perspective that can stand in the way of our quest for knowledge. These idols warn of the dangers inherent to both inductive and deductive approaches.

The second book provides the sort of lens that he believed was necessary to correct for the maligned images. In doing so, he did not argue that all the idols could be overcome. Indeed, the latter two types of idols (those of the marketplace and theater) could not be eradicated, as they denote social and ideological biases that are imposed from the outside. For these idols, we can only be aware of their existence and hope that this awareness will protect us from the insidious effects they have on our minds.

The first two idols, by contrast, “inhere in the nature of the intellect.” For this reason, Bacon believed that these idols of the tribe and the cave could be overcome by confronting them in a critical, balanced, and clear way. It is in this light that methodological reflection is so important for good science—whatever its ontological foundations. Bacon's solution to these problems was to develop a single method, called induction, which could correct these many distortions. This name for his method has fooled many into seeing Bacon as some sort of poster boy for atheoretical empiricist approaches. It is hoped that by reviewing his idols of the mind, readers will

see how critical Bacon was of the idea that simple observation alone could convey accurate knowledge of the Real World. Bacon's (1620/1863b) approach combined rational and empiricist elements in a middle-course approach:

Those who have handled sciences have been either men of experiment or men of dogmas. The men of experiment are like the ant, they only collect and use; the reasoners resemble spiders, who make cobwebs out of their own substance. But the bee takes a middle course: it gathers its material from the flowers of the garden and of the field, but transforms and digests it by a power of its own. Not unlike this is the true business of philosophy; for it neither relies solely or chiefly on the powers of the mind, nor does it take the matter which it gathers from natural history and mechanical experiments and lay it up in the memory whole, as it finds it, but lays it up in the understanding altered and digested. Therefore from a closer and purer league between these two faculties, the experimental and the rational (such as has never yet been made), much may be hoped. (Book 1, p. 95/xcv)

In the same way that Bacon counsels us to borrow from the ways of the ant *and* those of the spider, good methodologists need to be aware of—and draw from—competing worldviews, sources of knowledge, and methods. Choosing the right method requires critical reflection on how a given method can interrogate the world under study and generate the type of knowledge we hope to obtain.

—Jonathon W. Moses

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